



ALASKA
Department of
Environmental
Conservation

SITE CHARACTERIZATION REPORT ALASKA REAL ESTATE PARKING LOT

MARCH 2012



Prepared by:



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Anchorage, AK 99501

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March 7, 2012

Prepared for:

**Alaska Department of Environmental
Conservation**

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ACRONYMS AND ABBREVIATIONS

ACS.....	Alaska Communications Systems
ADEC	Alaska Department of Environmental Conservation
Air Toxics	Air Toxics, Ltd.
AWWU.....	Anchorage Water and Wastewater Utilities
bgs	below ground surface
CSM	Conceptual site model
DCE.....	Dichloroethene
DO.....	Dissolved oxygen
Enstar.....	Enstar Natural Gas Company
EPA.....	U. S. Environmental Protection Agency
ESA.....	Environmental site assessment
GCI.....	General Communications, Inc.
GCL.....	Groundwater cleanup level
GeoTek	GeoTek Alaska, Inc.
GW	Groundwater
mg/L	milligrams per liter
µg/m ³	micrograms per cubic meter
ML&P	Anchorage Municipal Light and Power
MOA.....	Municipality of Anchorage
NAD.....	North American Datum
NAVD	North American Vertical Datum
NC	Northern Commercial
OASIS	OASIS Environmental, Inc., an ERM company
PCE.....	Tetrachloroethene
PID	Photoionization detector
ppm	parts per million
PQL	Practical quantitation limit
SCL	Soil cleanup level
SG	Soil gas [sample]
SO	Soil [sample]
TCE	Trichloroethene
UST	Underground storage tank
VOC	Volatile organic compound

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EXECUTIVE SUMMARY

The Alaska Department of Environmental Conservation (ADEC) contracted OASIS Environmental, Inc, an ERM company (OASIS) to conduct a site investigation of Block 26B, East Addition Subdivision in Anchorage, Alaska. The request was in response to elevated concentrations of tetrachloroethene (PCE) in soil gas encountered during a 2009 site investigation.

The 2011 site investigation included advancing and installing four monitoring wells around the First Native Baptist Church and PIP Printing buildings located on Lots 5, 6, and 10A of Block 26B. Soil samples from the monitoring well boreholes were analyzed for the chlorinated alkenes, including PCE, trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-DCE, 1,1-DCE, and vinyl chloride. Groundwater samples were collected from the new monitoring wells and analyzed for the same compounds. In addition, nine soil gas points were installed around the two buildings. Four of the soil gas points (SG-7, SG-10, SG-13, and SG-14) were installed at 4 feet below ground surface (bgs) and are considered shallow soil gas points. Soil gas points SG-5, SG-6, SG-8, SG-11, and SG-12 were installed at 10 feet bgs and are considered deep soil gas points.

The soil gas points were sampled in April/May and November 2011 in order to evaluate soil gas concentrations during two seasons.

No chlorinated alkenes were detected in the soil samples. No chlorinated alkenes were detected in the groundwater samples with one exception; PCE was detected in the sample collected from monitoring well MW-8, located on the northwest corner of the church. The PCE concentration of 0.00024 milligrams per liter (mg/L) in the MW-8 sample was below the ADEC Table C cleanup level (18 AAC 75.345) of 0.005 mg/L.

The soil gas samples from four of the soil gas points (SG-5, SG-6, SG-13, and SG-14) contained no detectable chlorinated alkenes. PCE was detected in points SG-7, SG-8, and SG-11 during both the summer and winter sampling events. TCE was detected in SG-10 and SG-11 during both sample events. TCE only was detected in SG-12 during the winter sampling event. All PCE and TCE concentrations were below the ADEC commercial soil gas target levels.

The PCE and TCE concentrations remained stable or decreased in the shallow soil gas samples (SG-7 and SG-10) and increased in the deep soil gas samples (SG-8, SG-11, and SG-12) between the summer and winter sampling events. The variation in concentrations may be due to a combination of lower soil temperatures and frozen surface soil acting as a vapor barrier to escaping contaminant vapors. In this scenario, the shallow soil gas samples are affected more by the temperature change and the deep soil gas sample are less affected by the temperature change and more affected by the frozen "vapor barrier".

OASIS concludes that no unacceptable risk to human health or the environment exists due to soil or groundwater contamination at the site. The soil gas findings indicate that

chlorinated alkene vapors do not propose a vapor intrusion risk at the concentrations observed for the PIP Printing or First Native Baptist Church buildings.

1. INTRODUCTION

Under Notice-to-Proceed 18-4002-11-027, the Alaska Department of Environmental Conservation (ADEC) tasked OASIS Environmental, Inc., an ERM company (OASIS) with conducting site characterization activities at Block 26B, East Addition Subdivision (hereafter, "the site") in Anchorage, Alaska. The site is located on the northeast corner of the 4th Avenue and Hyder Street intersection (Figure 1). The site is located east of the Alaska Real Estate Parking Lot (Hazard ID 4084) which is located on the northeast corner of 4th Avenue and Gambell Street in Anchorage. This document describes the results of the site characterization activities and follow-up winter soil gas sampling.

1.1. Project Objectives

The scope of work for this project involved the following tasks:

- Install and sample four groundwater monitoring wells to assess soil and groundwater for volatile organic compounds (VOC's) associated with tetrachloroethene (PCE)
- Install and sample ten soil gas probes around the PIP Printing building at 833 East 4th Avenue and the First Native Baptist Church at 802 East 3rd Avenue to assess soil gas that could result in vapor intrusion of VOC's into the buildings. Six soil gas probes were installed at a depth of 4 bgs and four probes were installed at 10 feet bgs.
- Sample soil gas probes in winter 2011.

1.2. Site History

The properties in Block 26B are east and northeast of the Alaska Real Estate Parking Lot site where C&K Cleaners operated from 1968 to 1970 and Northern Commercial Tire Center operated from 1976 to 1978. The Alaska Real Estate Parking Lot site history is discussed below. Figures 2 and 3 show the sample locations and select historical sample results are discussed in the following paragraphs. Figure 2 shows the soil results for many of the boreholes and Figure 3 presents recent groundwater results for the monitoring wells.

A Phase I environmental site assessment (ESA) was performed for the site in 1993. The Phase I ESA identified the operation of a C&K Cleaners from 1968 to 1970 and a Northern Commercial (NC) Tire Center from 1976 to 1978. C&K Cleaners was located on the western side of the property, and NC Tire Center was located on the eastern side of the property. The Phase I site reconnaissance indicated that an underground storage tank (UST) vent pipe was visible on the property. All buildings were removed from the site in 1978. The site has since served as a parking lot (EnviroAmerica 1993).

A Phase II ESA was performed in 1997. Trenches dug near the former C&K Cleaners unearthed a log crib with four empty drums marked for use in dry cleaning. A soil sample collected near the drums had a concentration of tetrachloroethene (PCE) of 3.2 parts per

million (ppm). Seven hydraulic lifts, associated piping, sumps, an UST, and a log crib also were identified near the former NC Tire Center. Soil samples collected near the log crib had concentrations of PCE (4.5 ppm), ethylbenzene, toluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, arsenic, barium, cadmium, and chromium above ADEC soil cleanup levels (SCL). Three monitoring wells (MW-1, EPM-2, and EPM-3) also were installed. No VOC's were detected in EPM-2 and EPM-3. The concentration of PCE in MW-1 was 4.25 mg/L (EPMI 1997).

Another Phase II ESA was performed in August 2004, which included excavation of six test pits, removal of five hydraulic lifts, removal of four USTs, and removal of soil contaminated with diesel range organics above the SCL. The hydraulic lifts and USTs were associated with the former NC Tire Center operation. The contaminated soil came from underneath the hydraulic lifts and USTs. Concentrations of PCE above the SCL (1.73 to 4.2 mg/Kg) were detected in three of the test pits. These three test pits were located on the western side of the property near the location of the former C&K Cleaners (BGES 2004a).

Monitoring well MW-1 was sampled in October 2004. The sample was analyzed for VOC's by United States Environmental Protection Agency (EPA) method 8260. The concentration of PCE was 2.28 mg/L, which exceeds the ADEC groundwater cleanup level (GCL) of 0.005 mg/L. All other compounds were less than laboratory reporting limits (BGES 2004b).

Three additional monitoring wells (MW-2, MW-3, and MW-4) were installed in March 2005. Soil samples were collected from various intervals during drilling and were analyzed for VOC's. Concentrations of PCE ranged from 2,130 micrograms per kilogram ($\mu\text{g/kg}$) in the interval from 36 to 38 feet bgs in MW-4 to 79,500 $\mu\text{g/kg}$ in the interval from 28 to 30 feet bgs in MW-2. All other compounds were less than laboratory reporting limits. PCE results for groundwater were 1.49 mg/L in MW-1, 0.0707 mg/L in MW-2, 1.79 mg/L in MW-3, and 0.372 mg/L in MW-4. All other compounds in groundwater were less than laboratory reporting limits. The conclusion was made that biodegradation of PCE was not occurring at a significant rate because of a lack of PCE daughter compounds and the oxygenated state of the aquifer (BGES 2005). However, it should be pointed out that dissolved oxygen (DO) was measured at ground surface in purge water obtained by the use of a bailer, which generally does not provide a representative measurement for DO.

Five soil borings (A, C, D, E, and F) were drilled and three monitoring wells (MW-5, MW-6, and MW-7) were installed in an assessment performed in 2007. Soil samples were collected from two or three intervals in all eight borings. Concentrations of PCE exceeded the SCL in all samples. Concentrations of PCE in groundwater exceeded the GCL of 0.005 mg/L in all three wells: 0.523 mg/L in MW-5, 0.822 mg/L in MW-6, and 0.0051 mg/L in MW-7 (BGES 2007).

A site characterization was performed in July 2008. The site characterization included installing and sampling six soil borings (SB-1, SB-2, SB-3, SB-4, SB-5, and SB-6), sampling monitoring wells MW-5 and MW-6, and sampling two temporary wells (SB-1

and SB-2). Analytical results for soil borings SB-2, SB-3, SB-4, and SB-5 indicate an area of PCE-impacted soil that is located north and northeast of the former C&K Cleaners. Contamination is present at ground surface in the areas of SB-2, SB-3, and SB-4, but the significant mass of contamination occurs in a gravelly sand profile that begins around 15 feet bgs and extends to approximately 35 feet bgs. Analytical results from groundwater samples collected at the monitoring and temporary wells during this site characterization demonstrate that the PCE exceeds the GCL underneath the entire area of the former C&K Cleaners. The plume appears to extend northeastward, which is the reported direction of local groundwater flow. Based on the elevated PCE concentration in MW-2 and MW-6, the plume likely extends west of Gambell Street and north of 3rd Avenue, respectively. The absence of PCE or other significant concentrations of VOC's in temporary well SB-1 indicates that no upgradient source is contributing to contamination at the 4th and Gambell site (OASIS 2008).

Additional site characterization was performed in March 2009 and May 2009 with the inclusion of vapor intrusion assessments at four residential buildings located north of the 4th and Gambell site. The assessments included the collection of soil gas samples and outdoor air samples outside each building and the collection of either indoor air or crawl space air samples. Analytical results from the two assessments indicated that PCE was present in soil gas at concentrations exceeding ADEC target soil gas levels at all four residences for both sampling events. In addition, indoor air or crawl space analytical results showed that PCE also was present above ADEC indoor air target levels at all four residences for both sample events, except for the south duplex in June 2009. These findings indicated that PCE was present in the residences above risk-based screening levels, likely as a result of vapor intrusion (OASIS 2009).

Additional vapor intrusion and soil gas assessment activities were performed in February and May 2010. The assessment included indoor or crawl space air samples at the four residential buildings noted above. The results indicated that PCE concentrations exceeded ADEC target levels for both soil gas and indoor air, much the same as the results from the 2009 assessment. A passive soil gas survey was also performed for the four-block area between 3rd and 4th Avenues and between Gambell and Ingra Streets. The passive soil gas results showed that elevated PCE concentrations occur around the former C&K Cleaners and extend to the four residences. Elevated concentrations of PCE were also detected around the PIP Printing and First Native Baptist Church buildings, located one block east of the site (OASIS 2010).

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2. FIELD ACTIVITIES

This section presents a summary of the field activities performed as part of the site characterization. The field work generally followed the project work plan (OASIS 2011); minor deviations are noted in the subsections below. OASIS subcontracted GeoTek Alaska, Inc. (GeoTek) to advance the boreholes and install the monitoring wells and soil gas points. Field notes and sheets are included in Appendix A, photographs in Appendix B, survey data in Appendix C, and borehole logs in Appendix D.

2.1. Utility Locates

OASIS contacted Alaska Digline to have underground utilities located for a 75-foot radius around the two subject buildings. The locates were performed by Enstar Natural Gas Company (Enstar), General Communications Incorporated (GCI), Alaska Communications Systems (ACS), Anchorage Municipal Light and Power (ML&P), Anchorage Water and Wastewater Utility (AWWU), and the Municipality of Anchorage (MOA). Enstar has a 4-inch and a 10-inch diameter buried gas pipeline that runs parallel to the alleyway about 5 feet north of the PIP Printing building. AWWU also has a water line in the same area. These buried utilities posed conflicts for installing soil gas points SG-9 and SG-10. A gas line also runs north-south on the west side of the church, conflicting with the proposed location for MW-8. AWWU also has water and sewer lines running into the church building that conflicted with the proposed locations for SG-7 and MW-9. ML&P identified buried electric lines on the northwest side of the PIP Printing building that conflicted with the proposed location for SG-11.

After discussing these conflicts with the ADEC project manager, the borehole locations were moved as described below in Table 1.

Table 1. New Monitoring Well and Soil Gas Point Locations

Borehole ID	Utility Conflict	New Location
MW-8	Gas line	Approximately 10 feet east of proposed location (north of building in grassy area)
MW-9	Sewer line	Approximately 15 feet northeast of proposed location toward southeast corner of church.
MW-11	None	Approximately 15 feet northwest to a safe distance from parked cars.
SG-7	Water line O/H Electric	Approximately 10 feet west of proposed locations toward southwest corner of church.
SG-8	N/A	Co-located with SG-7, per ADEC project manager's request
SG-9	Gas line	To be installed by hand in original proposed location
SG-10	Gas line	Co-located with SG-12, per ADEC project manager's request.
SG-11	Electric lines	Approximately 10 feet south of proposed location, near back door of the building.

2.2. Monitoring Wells

GeoTek advanced the boreholes for the monitoring wells using a GeoProbe® 8040 DT direct-push drilling rig. The rig produced a 4.5-inch diameter borehole and provided a 3-

inch diameter continuous core of soil to the total depth of each borehole (approximately 50 feet bgs).

GeoTek advanced four soil borings for sampling and for monitoring well installation at the locations shown in Figure 4. Table 2 presents the soil boring and well construction details. Photograph 1 shows the drilling operation at MW-8. Photographs 2 and 3 show the locations of monitoring wells MW-9 and MW-10, respectively.

2.2.1. Soil Logging and Sampling

Each borehole was logged by the onsite geologist using the Unified Soil Classification System. OASIS collected soil for field screening and laboratory analysis at approximate 5-foot intervals throughout the soil core. OASIS used a heated headspace technique with a photoionization detector (PID) to screen the samples for total organic vapors and a Color-Tec® test kit to screen the samples for total chlorinated alkenes.

The Color-Tec® kit combines sample purging with direct-read gas detector tubes to detect low levels of chlorinated compounds. Photograph 2 shows the Color-Tec® system set up on site.

OASIS used the PID and Color-Tec® screening results to select two samples per borehole for laboratory analysis of PCE, trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-DCE, 1,1-DCE, and vinyl chloride using EPA Method 8260B. These six compounds will hereafter be referred to as chlorinated alkenes.

Table 2: Soil Boring / Monitoring Well Details

Borehole / Monitoring Well ID	Total Depth (feet)	Screened Interval (feet)	Number of Screening Samples Locations
MW-8	48	38-48	9
MW-9	48	38-48	9
MW-10	50	38-48	10
MW-11	48	38-48	10

2.2.2. Well Development and Sampling

OASIS waited 24 hours after installation before developing the monitoring wells. The wells were developed using a QED brand, 1.75-inch diameter bladder pump with dedicated, disposable, Teflon® bladders. In order to minimize the production of hazardous purge water, OASIS developed the wells by pumping with no surging. The bladder pump was moved slowly up and down along the screened interval of each well until the water was clear, based on the developer's best judgment.

The groundwater was allowed to re-equilibrate after development and then the wells were sampled using a low-flow sampling technique, producing a maximum drawdown of 0.08 feet during purging. The same Teflon® bladder used for well development was used to purge and sample the wells. Water quality parameters were recorded using a

YSI 556 water quality meter with a flow-through cell. The wells were purged until a minimum of four of the parameters (including temperature) stabilized. The parameters were considered stable when three successive readings, collected 3-5 minutes apart were within:

- $\pm 3\%$ for temperature (minimum of 0.2°C),
- ± 0.1 for pH,
- $\pm 3\%$ for conductivity,
- ± 10 mV for redox potential, and
- $\pm 10\%$ for DO.

The low-flow sampling sheets are included with the field notes in Appendix A.

After stabilization, OASIS collected the groundwater samples into three 40-milliliter, septa-lined vials and placed them in a cooler on ice to preserve the samples at a temperature of $4 \pm 2^{\circ}\text{C}$. The cooler was shipped to OnSite Environmental, an ADEC accredited laboratory in Redmond, Washington for analysis of chlorinated alkenes using EPA Method 8260B.

2.3. Soil Gas Points

GeoTek advanced nine boreholes for the soil gas points using a GeoProbe® 6620 direct-push drilling rig. No soil samples were collected during the soil gas point drilling phase. Figure 4 shows the soil gas point locations. The locations were designated as SG-5 to SG-14. Point SG-9 was not installed on the north side of the PIP Printing building due to the presence of two Enstar buried gas lines adjacent to the building in this location. Figure 5 shows the soil gas point construction details. Points SG-5, SG-6, SG-8, SG-11, and SG-12 were designated as deep soil gas points where the points were installed at 10 feet bgs. Points SG-7, SG-10, SG-13, and SG-14 were designated as shallow soil gas points, where the points were installed at 4 feet bgs.

The newly-installed soil gas points were allowed to set for 48 hours before they were sampled. The soil gas points were then leak tested before sampling. The leak tests consisted of two parts: a sampling manifold check and a soil gas monitoring point check. Figure 6 shows a schematic of the leak detection system used.

The manifold check involved pulling a vacuum on the sampling manifold, using a peristaltic pump, and then closing all valves. The sampler then monitored the vacuum gauge on the manifold. If the vacuum did not decrease after one minute, the manifold was considered leak-free.

The soil gas point check involved placing a leak detection hood over the exposed soil gas point tubing and attaching the monitoring point to the sampling manifold through connections in the leak detection hood. The hood also had connections for introducing a helium gas tracer to the hood. The sampling pump was used to pull soil gas through the manifold at a rate of 200 milliliters per minute. Two liters of soil gas were purged from the monitoring point and a field sample was collected into a tedlar bag. Helium was measured from the bag using a helium detector. A helium reading measured less than

10% of that in the leak detection hood was considered a successful leak check. The soil gas in the bag was also measured for oxygen, carbon dioxide, and volatile compounds using a RKI multi-gas meter.

The analytical samples were collected into 1-liter Summa canisters with a 5-minute flow controller. The canisters had an initial volume of between 28 and 30 inches of mercury. Once the leak checks were completed, the sampler closed all manifold valves except those between the soil gas point and the Summa canister. The Summa canister valve was then opened and the canister was allowed to fill for approximately 4 minutes. The valve was closed when the vacuum gauge reached 5 inches of mercury.

The canisters were packaged and shipped to Air Toxics Ltd. (Air Toxics) in Folsom, California for analysis of chlorinated alkenes using EPA Method TO-15 Modified.

2.3.1. November Soil Gas Sampling

The soil gas points installed in April were re-sampled on November 16 and 17, 2011. This sampling event was selected to occur after the ground had frozen to test soil gas concentrations during the winter months. The crew found two soil gas point monuments that had been damaged by snowplows; SG-5 and SG-13. The SG-5 monument was missing a monument cover and the SG-13 monument was totally destroyed. The tubing from the soil gas points was still intact and samples were collected from these two points. Photographs 5 and 6 show the condition of the two damaged soil gas points.

The samples were collected using the same method outlined in the section above and were analyzed by Air Toxics for the same chlorinated alkenes.

2.4. Sample Identification

The analytical samples were labeled with a sequential numbering system for the site. OASIS used the following format for sample identification:

- 11-4AG-001-SO

where “11” represents the year; “4AG” represents “4th and Gambell site”; 001 is the first sequential sample number; and SO is the designator for sample type. The sample designators include SO for soil sample, SG for soil gas sample, and GW for groundwater sample. Tables 3 to 5 cross reference the sample identification number with the sample location designations.

2.5. Investigation Derived Waste

The investigation derived waste for the summer field activities included soil cuttings, monitoring well development and purge water, sampling materials (soil sleeves, bladder pump tubing, etc.), and disposable personal protective equipment (PPE). The soil, water, and sampling equipment were segregated and stored on site pending results of the sampling. The IDW included two 55-gallon drums of soil, less than 25 gallons of development/purge water, and 1 drum of sampling materials and PPE.

The IDW from the winter soil gas sampling included Teflon-lined tubing and disposable PPE. OASIS determined that the winter event IDW would not be affected by soil gas

flowing through the tubing and could be considered a non-regulated waste. The IDW was bagged and disposed in the municipal trash.

2.6. Survey

Mammoth Consulting, L.L.C. surveyed the new monitoring wells (MW-8, MW-9, MW-10, and MW-11) and three previously existing monitoring wells (MW-5, MW-6, and MW-7) in November 2011. The survey crew was unable to locate previously existing wells MW-1 through MW-4.

The nine newly installed soil gas points (SG-5 through SG-8, and SG-10 through SG-14) were also surveyed. The horizontal spatial data are reported in both North America Datum (NAD) 83 and Alaska State Plane Zone 4 coordinate systems. The vertical data were reported in the North American Vertical Datum (NAVD) 88 coordinate system. The survey report is included in Appendix C.

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3. RESULTS

This section describes the findings of the site characterization including a discussion of soil types, groundwater levels, groundwater flow direction and gradient, and concentrations of chlorinated alkenes in soil, groundwater, and soil gas. Selected photographs of the project are included in Appendix B. The borehole logs are included as Appendix D. Appendix E includes the laboratory analytical reports and the ADEC data review checklists. The field and analytical results are included in Tables 3 to 5.

3.1. Soil Lithology

Sandy gravel comprises the uppermost soil lithology in this area. It is gray-brown, poorly sorted, and contains 70-80% gravel and 20-30% fine to coarse grained sand. The thickness of this layer varies from 0 feet in MW-8 to 13 feet in MW-11.

Gravelly sand consisting of 60 to 80% gravel and 20 to 40% sand underlies the sandy gravel. It is also gray brown and poorly sorted. All four boreholes contain at least one and up to five 1-inch to 3-inch coal layers between 15 and 20 feet bgs. The bottom of this interval contains several 0.5-feet to 1-foot thick well sorted sand layers.

A gray-brown, moderately sorted sand layer containing from 5% to 10% fine gravel underlies the gravelly sand. This layer varies in thickness from 1-foot in MW-9 to 7-feet in MW-11 where it extends to 33 feet bgs.

Gray-brown, well sorted sand, containing no gravel, underlies the layer described above. This layer extends from approximately 30 feet to 45 feet bgs.

Thin clay layers (0.1 to 1 feet thick) are present in the boreholes between 44 feet and 48 feet bgs. The clay is very dense, plastic, and varies in color from yellowish-gray to brick red.

3.2. Soil Sample Results

Table 3 presents the soil analytical results. The table includes the borehole location, the depth of the sample, the sample number as described in Section 2.4, the Color-Tec® screening result and the chlorinated alkene concentrations for each sample collected.

No chlorinated alkenes were detected in the Color-Tec® samples. Without any field screening detections, the onsite geologist selected analytical samples based on the following criteria:

- One sample from each borehole from approximately 20 feet bgs (the sample depth of highest PCE concentrations in MW-2 through MW-4); and.
- One sample from the vadose zone close to the water table.

OASIS compared the sample results and reporting limits the ADEC's most stringent Method Two SCLs. No chlorinated alkenes were detected above the practical quantitation limits (PQL) the soil samples. The PQL for most of the PCE, TCE, 1,1-DCE, and vinyl chloride are slightly above the ADEC SCLs. The PQL for all samples and all

analytes, however, are below the direct contact and outdoor inhalation cleanup levels for the Under 40-inch zone.

3.3. Groundwater Sample Results

Table 4 presents the groundwater analytical results for monitoring wells MW-8 through MW-11. The table includes the monitoring well location, the sample number, and the chlorinated alkene results. The results are compared to ADEC Table C cleanup values and to the ADEC groundwater target levels for vapor intrusion at commercial sites (ADEC 2009). No chlorinated alkenes were detected in the four samples with one exception. PCE was detected at 0.24 micrograms per liter ($\mu\text{g/L}$), which is below the ADEC Table C GCL. The PQL's for the all analytes are also below cleanup levels.

3.4. Soil Gas Sampling Results

Figure 4 shows the previously existing soil gas points (SG-1 to SG-4) and the newly installed soil gas points (SG-5 to SG-14, except for SG-9). The figure shows the March and June 2008 PCE and TCE results for the previously existing points and the May and November 2011 PCE and TCE results for the newly installed points. Table 5 presents the results for the 2011 soil gas samples. Table 5 also lists the ADEC shallow and deep soil gas target levels for commercial sites (ADEC 2009) for comparison to the project results. The commercial target levels are used because the PIP Printing building and the First Native Baptist Church buildings are occupied for a standard work week (8-10 hours a day, 5 days a week) or less.

No DCE compounds or vinyl chloride were detected in the summer or winter soil gas samples. PCE alone was detected in the SG-7 and SG-8 samples. TCE alone was detected in the SG-10 samples. Both PCE and TCE were detected in the SG-11 samples. Table 6 below presents the detected results from the two 2011 sampling events.

Table 6: Detected Results from 2011 Soil Gas Samples

Sample Location	PCE $\mu\text{g/m}^3$		TCE $\mu\text{g/m}^3$	
	May	November	May	November
SG-7	22	22	ND (5.9)	ND (3.6)
SG-8	82	170	ND (5.8)	ND (3.9)
SG-10	ND (7.7)	ND (4.6)	7.7	3.9
SG-11	13	29	33	46
SG-12	ND (7.5)	ND (4.6)	ND (5.9)	9.1

Table 6 indicates that the concentration of detected analytes either stayed the same or increased from the May concentrations, except for TCE in SG-10. The SG-10 November TCE concentration was approximately one-half of the TCE concentration in the May sample.

As shown in Table 5, the PCE and TCE commercial target levels for shallow soil gas are 210 micrograms per cubic meter ($\mu\text{g/m}^3$) and 11 $\mu\text{g/m}^3$, respectively (ADEC 2009). Soil

gas points SG-7 and SG-10 are considered shallow because they are 5 feet or less bgs. The PCE and TCE commercial target levels for deep soil gas are 2,100 $\mu\text{g}/\text{m}^3$ and 210 $\mu\text{g}/\text{m}^3$, respectively (ADEC 2009). Soil gas points SG-5, SG-6, SG-8, SG-11, and SG-12 are considered deep in that they are more than 5 feet bgs. The PCE and TCE concentrations are below the ADEC soil gas target levels in all sample locations with detected analytes. The PQLs for all analytes are also below target levels.

3.5. Investigation Derived Waste

Based on the non-detect soil sample results, OASIS received approval from the ADEC to treat the soil as non-hazardous and allow it to be spread on a lot owned by PIP Printing. The development/purge water contained minute amounts of PCE. OASIS received approval to treat the water as a non-regulated waste for the following reasons:

- Less than 220 pounds of hazardous waste were generated (based on a maximum of 25 gallons of water). The site, therefore, falls within a conditionally exempt small quantity generator status for Resource Conservation and Recovery Act hazardous waste.
- No EPA Identification number exists for the site and generator status update was required.

The drum of sampling materials and PPE were also disposed of as non-regulated waste. The drum contained mixed sampling materials/PPE from the soil, groundwater, and soil gas sampling. The IDW associated with the soil and soil gas sampling would not be impacted with contaminants. The small amount of tubing and PPE associated with the groundwater sampling did not increase the total weight of hazardous waste above 220 pounds.

The purge water waste determination and the non-hazardous waste manifest for the summer sampling event are included Appendix F.

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4. QUALITY ASSURANCE / QUALITY CONTROL

Laboratory Quality Assurance/ Quality Control (QA/QC) data associated with the analysis of project samples has been reviewed to evaluate the integrity of the analytical data generated during the April / May and November 2011 site characterization sampling at the Alaska Real Estate Parking Lot at 4th Avenue and Gambell Street in Anchorage, Alaska.

Groundwater and soil samples were shipped to OnSite Environmental Inc in Redmond, WA and results were reported in two sample delivery groups (SDG) 1104-214 and 1105-045. Soil gas samples were sent to Air Toxics LTD in Folsom, CA and results were reported in two SDGs 1105152 and 1111426. Samples were collected, reported, and shipped to in general accordance with the ADEC-approved work plan (OASIS 2011).

All data were reviewed in accordance with United States Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Methods (USEPA 2008) and ADEC regulatory guidance documents (ADEC 2009; 2010a; 2010b). This data review focused on the following QC parameters and their effect on the quality of data and usability: sample handling and chain-of-custody documentation; holding time compliance; field QC (trip blanks, field duplicates); laboratory QC (method blanks, surrogates, matrix spikes (MS) and MS duplicates (MSD); method reporting limits and completeness.

Samples were tested using the following methods for the associated analytes:

- USEPA 8260 – Volatile Organic Compounds (VOCs)
- TO-15 – Volatile Organic Compounds in Air

Sample results are considered usable for project objectives. The details of this review and qualification of the data are summarized in the following sections.

4.1. Sample Handling and Chain of Custody

The sample coolers were delivered with custody seals in place, unbroken and intact. All sample containers in the sample coolers were received at the laboratory intact, with proper documentation, and within the specified temperature range of 4°C ± 2°C.

4.2. Holding Times

All samples were extracted, digested, and/or analyzed within the holding time criteria for the applicable analytical methods and in accordance with the work plan specifications.

4.3. Field QA/QC

Field QA/QC protocols are designed to monitor for possible contamination during collection and transport of samples collected in the field. Collection and analysis of field duplicates also facilitates an evaluation of precision that takes into account potential variables associated with sampling procedures and laboratory analyses. For this project, trip blanks and field duplicates were submitted for analysis.

4.3.1. Trip Blanks

Three trip blanks were submitted with this SDG; one for the soil samples and two for the two sets of soil gas samples. All trip blank results were ND at concentrations above the analytical reporting limit (RL) or practical quantitation limit (PQL).

4.3.2. Field Duplicates

There were 4 groundwater samples and one field duplicate submitted – primary sample 11-4AG-012-GW and duplicate 11-4AG-015-GW. The RPD between primary and duplicates met the ADEC recommended <30% for water samples.

There were 9 primary samples and 1 field duplicate submitted – primary 11-4AG-002-SO with duplicate 11-4AG-009-SO. The RPD between primary and duplicates met the ADEC recommended <50% for soil samples.

There were 18 primary soil gas samples and two duplicates submitted – primary 11-4AG-032-SG with duplicate 11-4AG-033-SG; and primary 11-4AG-016-SG with duplicate 11-4AG-026-SG. The RPD between primary and duplicates met the ADEC recommended <25% for soil gas samples.

The frequency of field duplicate collection met the 10% frequency requirements specified in the work plan. There was adequate comparability of field duplicate results to meet project data quality objectives.

4.4. Laboratory QC

4.4.1. Method Blanks

Method blanks were analyzed concurrent with a batch of 20 or fewer primary samples for each of the analytical procedures performed for this project. Method blanks were analyzed at the required frequency and target analytes were not detected (ND) in the blanks at concentrations above the analytical reporting limit or PQL.

4.4.2. Matrix Spikes

Extra volumes of primary field samples were collected and submitted to the laboratory for matrix spike/matrix spike duplicate (MS/MSD) analyses. Matrix spikes have a known quantity of target analytes are added (spiked) to field samples. Spike recoveries are calculated and are used to evaluate both site conditions and laboratory quality control. MS/MSD percent recoveries (%R) and RPDs were within limits.

4.4.3. Surrogates

Surrogate recoveries were within prescribed control limits for all primary samples and MS/MSD.

4.5. Reporting Limits

Method Reporting Limits (MRLs) and PQLs met or were below established criteria specified for all analyses in the project work plan. The reporting limits were also below the ADEC established cleanup levels.

4.6. Precision and Accuracy

Precision criteria monitor analytical reproducibility. Accuracy criteria monitor agreement of measured results with “true values” established by spiking applicable samples with a known quantity of analyte or surrogate. Precision and accuracy were evaluated by comparing MS/MSDs and field duplicate pairs for this project. Field duplicates and MS/MSD samples were collected in accordance with Work Plan specifications. Field duplicate RPDs met applicable control limits. Recoveries and RPDs for all MS/MSD samples were within required limits. Data Quality Objectives of an overall 90% accuracy in QC samples were met.

4.7. Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). The overall project completeness goal is 90%:

$$\% \text{ completeness} = \frac{\text{number of valid (i.e., non-R flagged) results}}{\text{number of possible results}}$$

All requested analyses were performed in accordance with work plan specifications. No were qualified as unusable (i.e., “R”). Completeness for this project is 100%.

4.8. Representativeness and Comparability

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were specified in the Work Plan and verified in the field to account accurately for site variations and sample matrices. The data quality objectives (DQO) for representativeness were met.

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this project followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

4.9. Data Summary

Based upon the information provided, the data are acceptable for use. All requested analyses were performed in accordance with work plan specifications. No results were qualified as unusable (i.e., “R”). Completeness for this project is 100%. In general, the overall quality of the data was acceptable for the objectives established for this project.

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5. CONCEPTUAL SITE MODEL

The results of this site investigation have not altered the conceptual site model (CSM) for the Alaska Real Estate Site, but have helped bound the extent of contaminated to the east of the site. No chlorinated alkenes were encountered above ADEC Method Two soil cleanup levels in the 2011 monitoring well soil borings. No chlorinated alkenes were detected above ADEC Table C cleanup level in the 2011 monitoring well samples. The soil gas contaminant concentrations around the Block 26B buildings were also below the ADEC target levels for commercial sites.

A CSM for the Block 26B site, as separate from the Alaska Real Estate Parking Lot site, is discussed below. Appendix G contains a CSM scoping form and a CSM graphic based on the ADEC's CSM guidance document (ADEC 2005).

No chlorinated alkenes were detected in soil samples collected at the Block 26B site, so the incidental soil ingestion and dermal absorption of contaminants from soil pathways are incomplete.

PCE was detected in groundwater from MW-8, at the northwest corner of Block 26B. The ADEC has not determined that the groundwater will not be used as a future drinking water source and, therefore, the ingestion of groundwater pathway must be considered complete. As the PCE concentration in the MW-8 sample was less than one-tenth of the ADEC Table C GCL, however, the pathway may be considered insignificant (ADEC 2005).

No surface water bodies are present on the site, so the ingestion of surface water pathway is incomplete.

The site is not in an area that could be reasonable used for hunting, fishing, or harvesting of wild animals or farmed foods, so the ingestions of wild and farmed foods pathway is incomplete.

Although no chlorinated alkenes were detected in the soil samples collected from Block 26B, five of nine soil gas samples collected from around the PIP Printing and First Native Baptist Church buildings contained detectable PCE and TCE. The contaminant concentrations were below the corresponding ADEC soil gas target levels for commercial sites, suggesting that the inhalation of indoor and outdoor air pathways, though complete, may not be considered significant.

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6. CONCLUSIONS

OASIS conducted a site characterization at Block 26B, East Addition Subdivision in Anchorage, Alaska on behalf of the ADEC. The investigation included advancing and sampling soil boreholes for installation of four monitoring wells (MW-8, MW-9, MW-10, and MW-11), groundwater sampling of the newly installed monitoring wells, and installing and sampling nine soil gas points around the PIP Printing building and the First Native Baptist Church (SG-5, SG-6, SG-7, SG-8, SG-10, SG-11, SG-12, SG-13, and SG-14). The following is a summary of the findings from the investigation:

- Four boreholes were advanced to approximately 50 feet deep. A chlorinated alkene field screening sample was collected for each 5 feet of soil core. Two samples per borehole were sent for analysis of chlorinated alkenes (PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, and vinyl chloride).
- Four monitoring wells were installed in the boreholes and then developed and sampled for chlorinated alkenes.
- Nine out of ten planned soil gas points were installed around the PIP Printing building on Lot 10A and the First Native Baptist Church on Lots 5 and 6. Five deep soil gas points were installed at 10 feet bgs and four shallow gas points were installed at 4 feet bgs. The soil gas points were sampled for chlorinated alkenes. Soil gas point SG-9 was not installed due to buried utility conflicts.
- None of the soil samples contained detectable chlorinated alkenes, in either field screening samples or analytical samples.
- The groundwater samples did not contain detectable chlorinated alkenes except for the sample from MW-8, which contained 0.00024 mg/L PCE. This concentration is below the ADEC Table C GCL.
- No chlorinated alkenes were detected in the samples from four of the nine soil gas locations. Three deep and two shallow gas points had detectable PCE and TCE. The concentrations did not exceed the corresponding ADEC commercial soil gas target levels.
- The PCE and TCE concentrations in the two deep soil gas points (SG-8 and SG-11) were higher during the November sampling event than during the May sampling event. The PCE and TCE concentrations in the two shallow soil gas points (SG-7 and SG-10) either remained the same or decreased between the two events. The two following factors would be expected to affect the concentrations in the November soil gas samples:
 - Colder soil temperatures would produce less vapor than warmer temperatures.
 - Frozen surface soil would act as a barrier for vapor escaping to the atmosphere.

It appears that concentrations in the shallow soil gas samples are more affected by colder temperatures and concentrations in the deep soil gas samples are less affected by temperature and more affected by the frozen ground “vapor-barrier” effect.

Based on the above findings and the CSM for the Block 26B site, OASIS concludes that no unacceptable risk to human health or the environment exists due to soil or groundwater contamination observed at the site. The soil gas findings indicate that chlorinated alkene vapors are not intruding into the PIP Printing or First Native Baptist Church buildings.

7. REFERENCES

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TABLES

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TABLE 3: SOIL SAMPLE RESULTS
ALASKA REAL ESTATE PARKING LOT SITE INVESTIGATION
APRIL 2011

Boring	Sample Depth (ft)	Sample Number	Color-Tec (ppm)	PCE (mg/kg)	TCE (mg/kg)	cis-1,2-DCE (mg/kg)	trans-1,2-DCE (mg/kg)	1,1-DCE (mg/kg)	Vinyl Chloride (mg/kg)
ADEC Method Two MTG Cleanup Level				0.024	0.02	0.24	0.37	0.03	0.0085
ADEC Method Two Direct Contact Cleanup Level				15	21	1,000	2,000	14	5.5
ADEC Method Two Outdoor Inhalation Cleanup Level				10	0.57	130	160	0.85	4.3
MW-8	6.5 - 8.0		ND						
	14.0 - 14.6		ND						
	19.6 - 20.8	11-4AG-001-SO	ND	ND (0.026)	ND (0.026)	ND (0.026)	ND (0.026)	ND (0.026)	ND (0.026)
	24.2 - 25.5		ND						
	30.0 - 31.0		ND						
	34.0 - 35.0		ND						
	40.0 - 41.0		ND						
	46.4 - 47.0	11-4AG-002-SO	ND	ND (0.038)	ND (0.038)	ND (0.038)	ND (0.038)	ND (0.038)	ND (0.038)
MW-9		11-4AG-009-SO*	ND	ND (0.037)	ND (0.037)	ND (0.037)	ND (0.037)	ND (0.037)	ND (0.037)
	4.0 - 5.0		ND						
	10.0 - 11.0		ND						
	16.1 - 17.0		ND						
	19.0 - 20.0	11-4AG-003-SO	ND	ND (0.034)	ND (0.034)	ND (0.034)	ND (0.034)	ND (0.034)	ND (0.034)
	25.1 - 26.0		ND						
	31.5 - 32.6		ND						
	36.0 - 37.0		ND						
MW-10	40.0 - 41.0	11-4AG-004-SO	ND	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)	ND (0.040)
	44.2 - 45.1		ND						
	2.0 - 3.0		ND						
	7.0 - 8.0		ND						
	13.0 - 14.0		ND						
	17.0 - 18.0	11-4AG-005-SO	ND	ND (0.033)	ND (0.033)	ND (0.033)	ND (0.033)	ND (0.033)	ND (0.033)
	20.6 - 21.4		ND						
	27.2 - 28.2		ND						
	32.0 - 33.0		ND						
	37.0 - 38.0	11-4AG-006-SO	ND	ND (0.036)	ND (0.036)	ND (0.036)	ND (0.036)	ND (0.036)	ND (0.036)
	41.0 - 42.0		ND						
	46.2 - 47.5		ND						

TABLE 3: SOIL SAMPLE RESULTS
ALASKA REAL ESTATE PARKING LOT SITE INVESTIGATION
APRIL 2011

Boring	Sample Depth (ft)	Sample Number	Color-Tec (ppm)	PCE (mg/kg)	TCE (mg/kg)	cis-1,2-DCE (mg/kg)	trans-1,2-DCE (mg/kg)	1,1-DCE (mg/kg)	Vinyl Chloride (mg/kg)
MW-11	1.0 - 2.0		ND						
	5.0 - 6.0		ND						
	10.3 - 11.4		ND						
	15.0 - 16.0		ND						
	20.0 - 21.0	11-4AG-007-SO	ND	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.025)
	24.0 - 25.0		ND						
	31.0 - 32.0		ND						
	35.0 - 36.0		ND						
	41.0 - 41.8	11-4AG-008-SO	ND	ND (0.034)	ND (0.034)	ND (0.034)	ND (0.034)	ND (0.034)	ND (0.034)
	45.0 - 46.0		ND						
Trip Blank				ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)	ND (0.050)

Key:
ADEC = Alaska Department of Environmental Conservation
DCE = Dichloroethene
ft = Feet
mg/kg = Milligrams per kilogram
MTG = Migration to Groundwater
ND = Not detected
PCE = Tetrachloroethene
ppm = Parts per million
TCE = Trichloroethene

Note: Value in parenthesis is the laboratory reporting limit.
* Sample is duplicate of 11-4AG-002-SO

TABLE 4: GROUNDWATER SAMPLE RESULTS
ALASKA REAL ESTATE PARKING LOT SITE INVESTIGATION
APRIL / MAY 2011

Well ID	Sample Number	PCE (mg/L)	TCE (mg/L)	cis-1,2-DCE (mg/L)	trans-1,2-DCE (mg/L)	1,1-DCE (mg/L)	Vinyl Chloride (mg/L)
ADEC Table C Cleanup Levels		0.005	0.005	0.07	0.1	0.007	0.002
ADEC VI GW Target Levels**		0.029	0.0028	0.920	0.960	0.0023	0.00092
MW-8	11-4AG-011-GW	0.00024	ND (0.00020)	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)
MW-9	11-4AG-012-GW	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)
	11-4AG-015-GW*	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)
MW-10	11-4AG-013-GW	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)
MW-11	11-4AG-014-GW	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)

Note: Value in parenthesis is the laboratory reporting limit.

* Sample is duplicate of 11-4AG-012-GW

** Based on ADEC Draft Vapor Intrusion Guidance for Contaminated Sites, July 2009, Appendix G, Commercial Levels

Key:

ADEC = Alaska Department of Environmental Conservation

DCE = Dichloroethene

GW = Groundwater

µg/L = milligrams per liter

ND = Not detected

PCE = Tetrachloroethene

TCE = Trichloroethene

VI = Vapor Intrusion

TABLE 5: SOIL GAS SAMPLE RESULTS
ALASKA REAL ESTATE PARKING LOT SITE INVESTIGATION
SUMMER AND WINTER 2011

Location	Depth	Sample ID	Sampling Event	Field Parameters				Chlorinated Alkenes					
				Methane/Hexane	Oxygen	Carbon Dioxide	Helium Leak Check	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethene	Vinyl Chloride
Units				ppm	%	%	ppm	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
ADEC Shallow Commercial Soil Gas Target Level								210	11	1500	2600	25	11
ADEC Deep Commercial Soil Gas Target Level								2100	110	15000	26000	250	110
SG-5	Deep	11-4AG-016-SG	May	NR	20.9	0.70	0	ND (7.3)	ND (5.8)	ND (4.3)	ND (4.3)	ND (4.3)	ND (2.7)
		11-4AG-026-SG*		NR	20.9	0.70	0	ND (7.4)	ND (5.8)	ND (4.3)	ND (4.3)	ND (4.3)	ND (2.8)
		11-4AG-036-SG	November	NM	NM	NM	0	ND (4.6)	ND (3.6)	ND (2.7)	ND (2.7)	ND (2.7)	ND (1.7)
SG-6	Deep	11-4AG-017-SG	May	NR	20.4	1.30	0	ND (8.4)	ND (6.7)	ND (4.9)	ND (4.9)	ND (4.9)	ND (3.2)
		11-4AG-027-SG	November	NR	20.6	1	0	ND (4.6)	ND (3.6)	ND (2.7)	ND (2.7)	ND (2.7)	ND (1.7)
SG-7	Shallow	11-4AG-018-SG	May	NR	20.7	0.50	0	22	ND (5.9)	ND (4.4)	ND (4.4)	ND (4.4)	ND (2.8)
		11-4AG-034-SG	November	Erroneous Readings			0	22	ND (3.6)	ND (2.6)	ND (2.6)	ND (2.6)	ND (1.7)
SG-8	Deep	11-4AG-019-SG	May	NR	19.8	1.10	0	82	ND (5.8)	ND (4.3)	ND (4.3)	ND (4.3)	ND (2.7)
		11-4AG-035-SG	November	NR	20.9	1.24		170	ND (3.9)	ND (2.8)	ND (2.8)	ND (2.8)	ND (1.8)
SG-9	Shallow	Not installed											
SG-10	Shallow	11-4AG-021-SG	May	NR	18.8	2.30	0	ND (7.7)	7.7	ND (4.5)	ND (4.5)	ND (4.5)	ND (2.9)
		11-4AG-029-SG	November	NR	19.7	1.32	0	ND (4.6)	3.9	ND (2.7)	ND (2.7)	ND (2.7)	ND (1.7)
SG-11	Deep	11-4AG-022-SG	May	180	19.9	1.40	0	13	33	ND (4.3)	ND (4.3)	ND (4.3)	ND (2.8)
		11-4AG-032-SG	November	NR	20.9	0.98	0	29	46	ND (3.1)	ND (3.1)	ND (3.1)	ND (2.0)
		11-4AG-033-SG**		NR	20.9	0.98	0	29	44	ND (3.0)	ND (3.0)	ND (3.0)	ND (1.9)
SG-12	Deep	11-4AG-023-SG	May	250	18.5	2.10	0	ND (7.5)	ND (5.9)	ND (4.4)	ND (4.4)	ND (4.4)	ND (2.8)
		11-4AG-028-SG	November	NR	18.2	2.12	0	ND (4.6)	9.1	ND (2.7)	ND (2.7)	ND (2.7)	ND (1.7)
SG-13	Shallow	11-4AG-024-SG	May	NR	19.3	1.90	0	ND (7.3)	ND (5.8)	ND (4.3)	ND (4.3)	ND (4.3)	ND (2.7)
		11-4AG-031-SG	November	NR	20.7	1.36	0	ND (5.5)	ND (4.3)	ND (3.2)	ND (3.2)	ND (3.2)	ND (2.0)
SG-14	Shallow	11-4AG-025-SG	May	NM	NM	NM	0	ND (7.3)	ND (5.8)	ND (4.3)	ND (4.3)	ND (4.3)	ND (2.7)
		11-4AG-030-SG	November	NR	17.9	1.8	0	ND (4.7)	ND (3.7)	ND (2.8)	ND (2.8)	ND (2.8)	ND (1.8)

Note: Value in parenthesis is the laboratory reporting limit.

* Sample is duplicate of 11-4AG-016-SG (SG-5)

** Sample is duplicate of 11-4AG-032-SG (SG-11)

NM - Insufficient soil gas to take multi-gas reading

NR - Value recorded in %LEL instead of ppm.

Key: ADEC = Alaska Department of Environmental Conservation

Deep = Collected 5 feet or less below ground surface or 5 feet or less below a foundation

Shallow = Collected more than 5 feet below ground surface or more than 5 feet below a foundation

LEL = Lower explosive limit

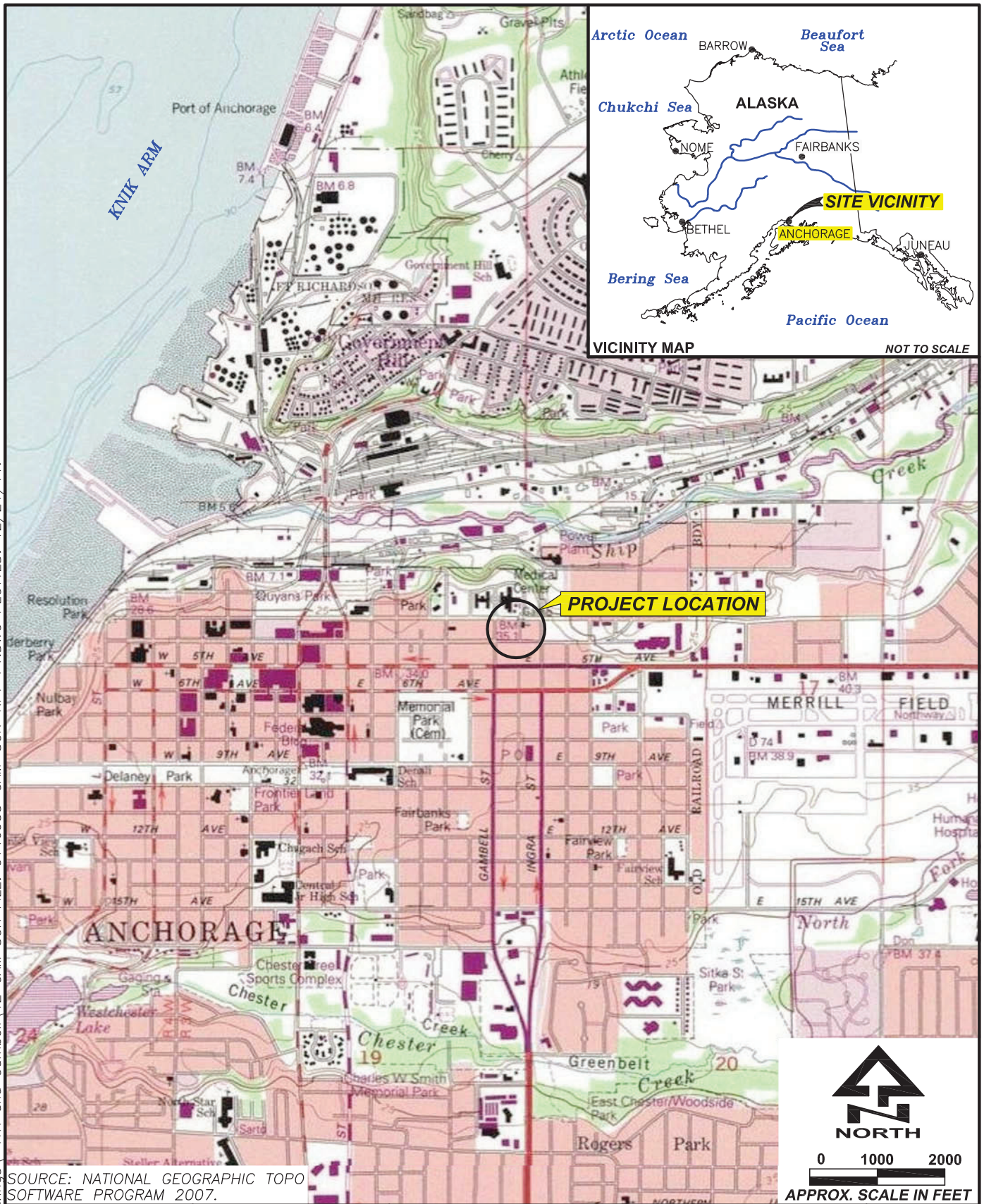
ppm = parts per million

µg/m³ = micrograms per cubic meter

FIGURES

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SOURCE: NATIONAL GEOGRAPHIC TOPO
SOFTWARE PROGRAM 2007.



DATE: DEC. 2011
CHKD: L.C.N.
DRAWN: C.E.H.
PROJ. No.: 0146933
825 W. 8th Ave., Anchorage,
AK 99501, (907) 258-4880

SITE LOCATION MAP

4TH AND GAMBELL
SITE CHARACTERIZATION REPORT
Anchorage, Alaska

FIGURE

1

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FIGURE

2

1997 TO 2011 SOIL ANALYTICAL RESULTS

4TH AND GAMBELL
SITE CHARACTERIZATION REPORT
Anchorage, Alaska

DATE: DEC. 2011

CHKD: L.C.N.

DRAWN: C.E.H.

PROJ. No.: 0146933

825 W. 8th Ave., Anchorage,
AK 99501, (907) 258-4880



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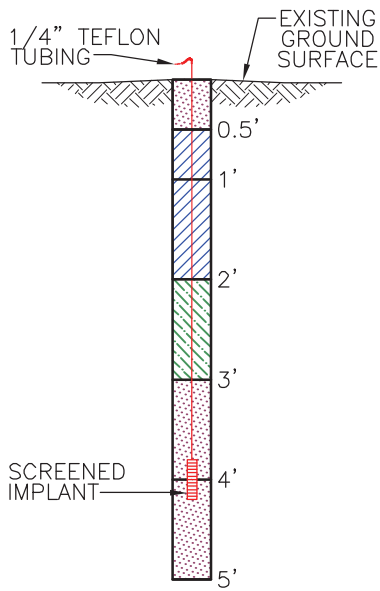


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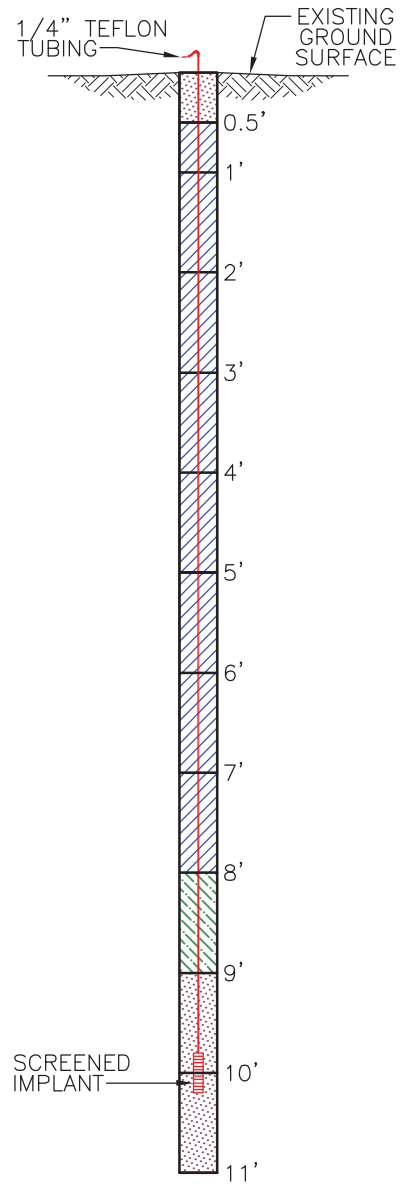
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PATH: V:\Project Drawings\ 4TH and Gambell\11 GAM SCWP RPT FILE: 14-200-GAM-SCWP-RPT-F5.DWG PLOTTED: 3/24/11.

SHALLOW SOIL GAS PROBE



DEEP SOIL GAS PROBE



-  HYDRATED BENTONITE SLURRY
-  DRY GRANULAR BENTONITE
-  10/20 SILICA SAND

NOT TO SCALE



DATE: MAR. 2011
CHKD: L.C.N.
DRAWN: C.L.H.
PROJ. No.: 14-200
825 W. 8th Ave., Anchorage,
AK 99501, (907) 258-4880

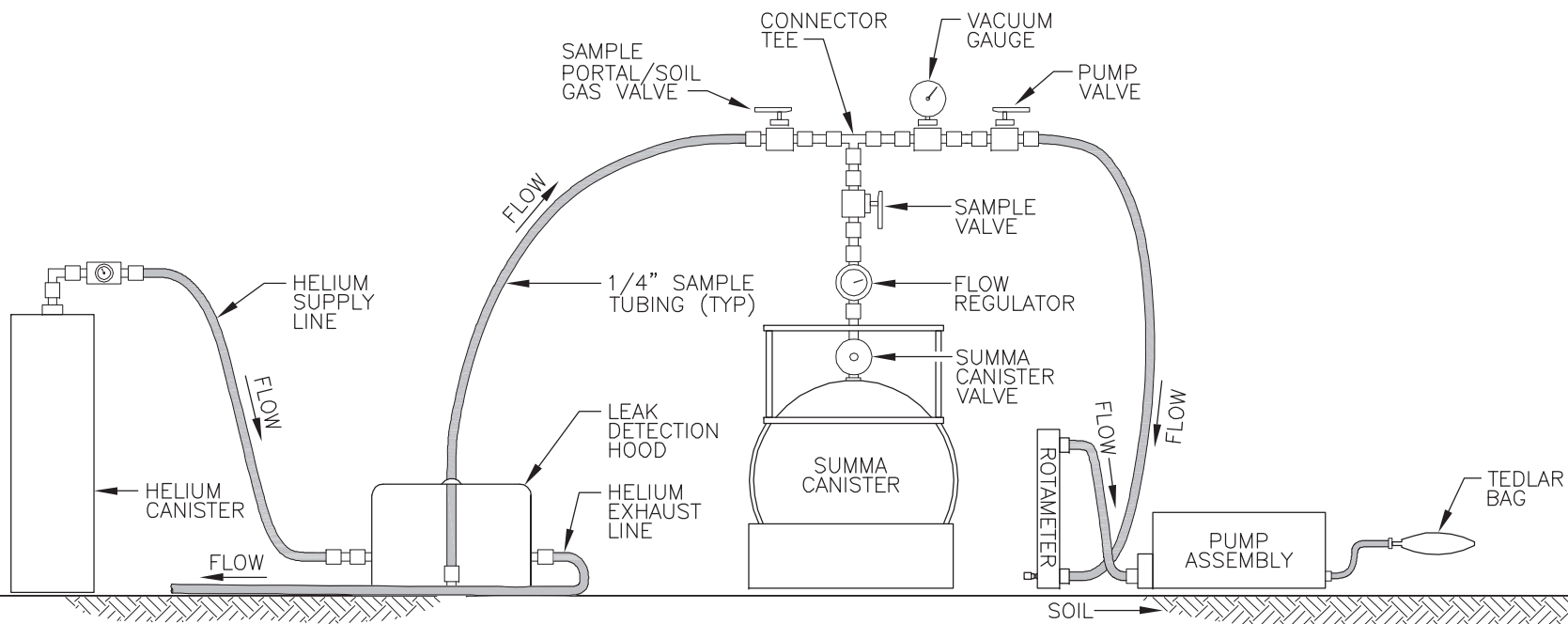
TYPICAL SOIL GAS PROBES

4TH AND GAMBELL
SITE CHARACTERIZATION WORK PLAN
Anchorage, Alaska

FIGURE

5

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NOT TO SCALE



DATE: MAR. 2011
 CHKD: L.C.N.
 DRAWN: C.L.H.
 PROJ. No.: 14-200
 825 W. 8th Ave., Anchorage,
 AK 99501, (907) 258-4880

LEAK DETECTION SCHEMATIC

4TH AND GAMBELL
 SITE CHARACTERIZATION WORK PLAN
 Anchorage, Alaska

FIGURE

6

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APPENDIX A

Field Notes and Sampling Sheets

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Alaska Real Estate Parking Lot
(4th & Gambell Project)

2011 Site Characterization



"Rite in the Rain"®

ALL-WEATHER

JOURNAL

No. 393N

14-200

[illegible]

1

Water main runs down alley; as does gas line. Soil gas points near Nendth building are not possible. Moved

- Moved MW-9 away from sewer line into church.

1400 Meet Geo Tek at site - they are unloading drill. Lisa & Mike set up. to log, sample & screen.

Span cal (Isobutylene 100 ppm) = 100 ppm.

1730 Finish drilling at 50' bgs.

③ Star Prep for setting well.
Lisa & Mike continue logging
and sampling.

K. Van

4/25/11 (cont'd)

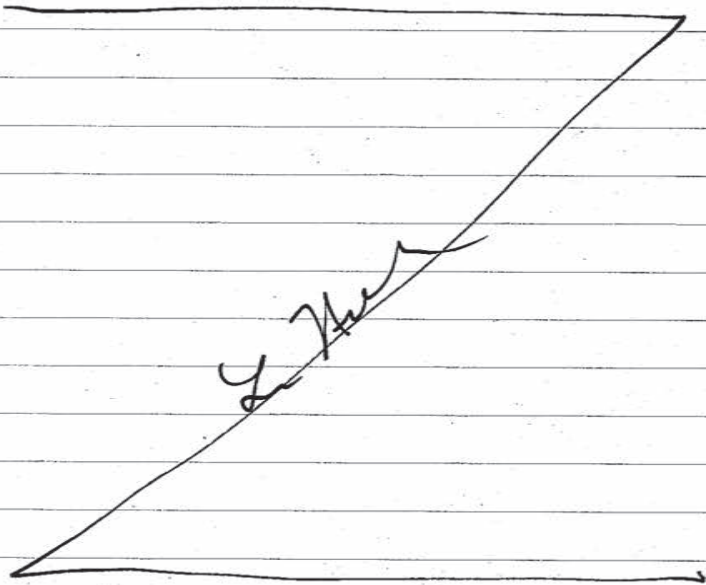
GeoTek has problems removing ^{core} drill casing due to heaving sands. Ask if we can leave casing in ground overnight & bring out equip to remove & install well tomorrow morning. Agree to this plan.

1815 GeoTek leaves site

1845 Finish logging & samples. Clean up. Move drum to edge of parking area - label drum.

1900 Leave site. To office. Drop off samples in refrigerator.

1920 End of field day



4/26/11 L. Nicholson. M. Helms.

Weather: 40°F; calm.

0730 Arrive site. Drillers have already arrived, set up drill, and left.

Elliot left message that they are still unable to remove drill ^{case} casing and are back at office working into Plan B.

0830 Drillers arrive site with extra dunnage to provide support while pulling.

0845 Tailgate safety meeting. New helper - Mark Thompson.

Reads over HSE plan & signs in appropriate places. Driller is Elliot Wilson.

0850 Drillers install well. Will leave flush mount completion til end of day. Place cones around well.

0930 Move to MW-11 location. Setup

1010 ^{to} Start drilling

1400 Finish setting well (except for concrete around flush mounts)

Lisa & Mike finish off sampling and logging.

4/26/11 (cont'd)

1410 Move to MW-9. Set up east of original location (to move away from overhead lines, sewer line, water line & gas lines).

1430 Start drilling

1745 Drillers finish setting well. Clean up - move to MW-10 & complete well (bentonite @ hydrated bentonite from 2' above screen to surface)

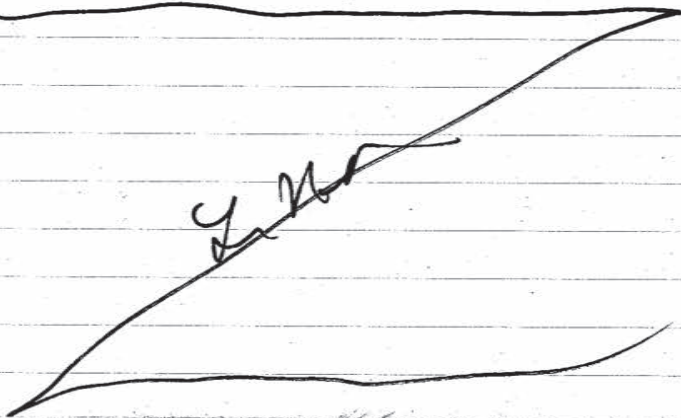
1800 Lisa and Mike continue logging, sampling, and screening.

1820 Drillers leave site with 2 of 3 trucks. Will shuttle someone back for 3rd truck

1900 Finish logging, sampling, & screening move soil to drums.

1905 To office. Manage samples etc

1930 End of field day



4/27/11 L. Nicholson · M. Helms

Weather: 37°F; Intermittent rain, calm

0735: Meet at site. Drillers have arrived & were able to set up on MW-8. Tight fit. Some damage to sod - should restore sod to original condition after well completion

0740 Tailgate safety meeting

0745 Drillers prep; Lisa calibrates

PID: Note @ Fresh air cal = 0.0

Span cal = 100 ppm

* NOTE: PID calibrated before sampling on 4/26/11 also

Fresh air = 0.0 Span cal = 100 ppm

Cal check at end of day = 100 ppm

1230 Finish installing MW-8. Drillers clean up site. Place sod pieces back in place.

1240 Mike to office for training & lunch. Lisa finishes clean up - talks to drillers

1245 Lisa to lunch

1315 Lisa to office. Drillers to site with Geoprobe 6610 rig to install soil gas points

4/27/11 (cont'd)

1415 Tim McDougall has discussed placement of soil gas points with Todd Blessing. Since we cannot place ~~a deep soil~~ soil gas points with the drill on the north side of the PIP Printing building (due to US utilities), we will move SG-10 from N. side of building to east side of bldg adjacent to SG-12. (shallow & deep are co-located). Also co-locate SG-7 & SG-8 on S. side of church.

1435 At site. Show Elliot location of PIP printing points. Tim has already completed the building survey. Church building survey is scheduled for 1500.

1500 Start drilling & installing points SG-10, SG-12, SG-14, SG-13.

1700 Talk to Tim McDougall re: church building survey. Notes that the church has a basement so all points should be deep except SG-7, which will be adjacent to SG-8.

4/27/11 (cont'd)

1510 Talk to Pastor Lane re: Bible study at 1800. We will not drill during that time. Ask to access fenced area to place SG-6.

1530 Finish w/SG-6 - move to SG-11. Drillers do not have enough tubings or flush mounts to put in last 4 holes (drill 3 & provide materials for 4th). Mix up at GeoTec - they still thought we were only putting in 6 soil gas points.

They will get the materials & come back on Friday to install

1800 Finish with the six SG points. Drill crew moves drum from installing MW-10 into fenced area.

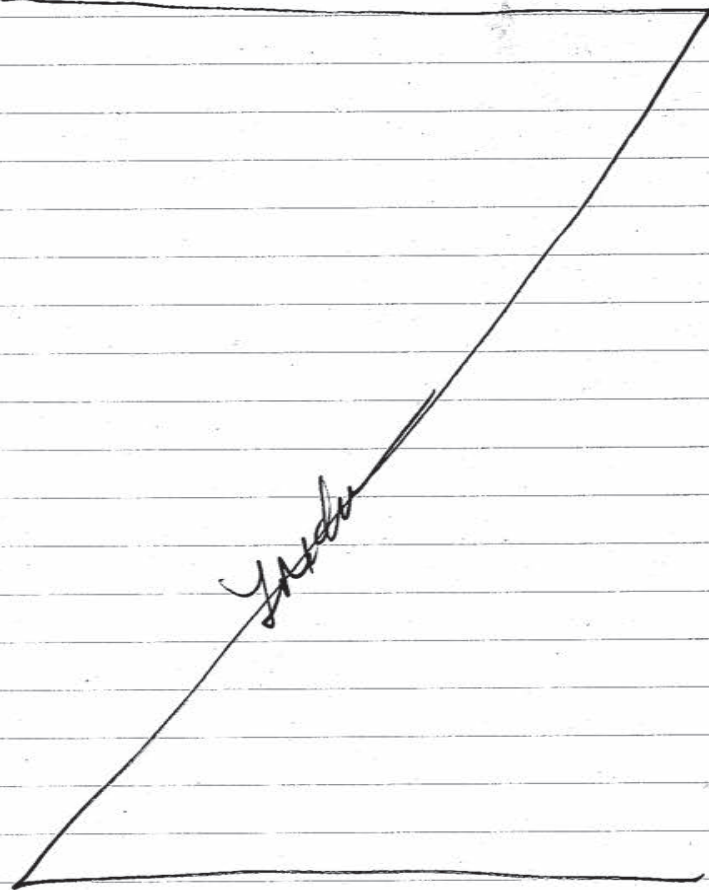
1820 Drillers take 2 truck & leave site. Will return for truck & small rig's horse trailer. When they return they will ~~bring~~ drop off 2 drums for development & purge water.

4/27/11 (cont'd)

Mike is removing garbage bags from soil drums & placing them in a separate drum.

1900 Finish up & leave site for office.
Demob

1930 End of field day



4/28/11 L. Nicholson; M. Helms

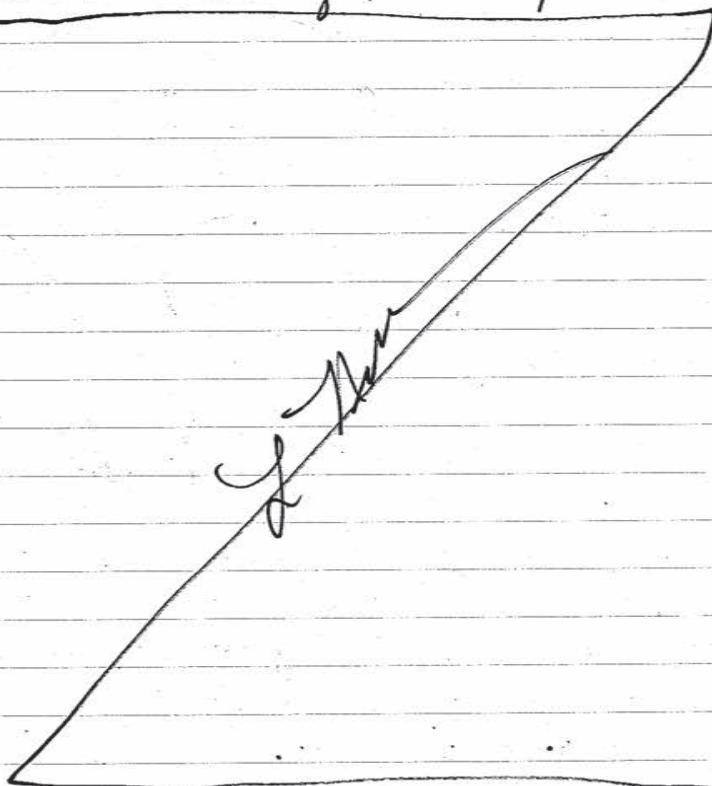
1630 Arrive site. Set up bladder pump on MW-8.

1730 Start pumping to develop well.

Pump for 45 minutes. Just starts to clean up. Decide to finish development tomorrow, just before sampling. Has good recharge.

1830 Leave site for office. Demob.

9:40 1900 End of field day



4/29/11 L. Nicholson; M. Helms

Weather: 39°F; slight breeze from N.
clear.

0730 Meet office - pick up gear for
well sampling & soil gas sampling.

0800 To site. Set back up on MW-8.
Have trouble with bladder pump.
Mike calls TIT Environmental to
discuss. Turns out to be problem
with compressor. After turning
on & off a few times it works
again.

Realize that battery is dying.
Call Erin McDonald who plans
to come out to demonstrate
soil gas sampling technique.

She will bring a charged
battery with her.

0900 Nate Oberlee (GeoTek) calls
re: time for drillers to come
out & finish soil gas points.
Also discuss possible techniques
for installing soil gas point by
hand. Nate suggests hand-
driven Geoprobe tool with
sacrificial point. He says
don't use

4/29/11 (cont'd)

that his guys can install it
for me if we have our
Geoprobe tool. Call office.
Geoprobe tool is not in any of
the storage rooms.

Call Fairbanks office. Geoprobe
is in Fairbanks. Andrew will
send it down, but it needs to
be back by May 17.

0930 Erin McDonald arrives.

MW-8 is almost ready to sample.
~~Decide to~~ Decide to have
Erin show Mike the ropes re:
soil gas while Lisa stabilizes
and samples well. Lisa will
catch up on second soil gas
sample.

1000 Drillers arrive to install last
soil gas points. Safety
meeting with all of the crew.
Show Connor (driller) where
to drill the last 3. Have
him leave behind materials
for 4th soil gas pt. install.

4/29/11 (cont'd)

Erin helps Mike calibrate YSI while Lisa is busy with drillers.

1100 Lisa preps for sampling MW-8

Erin & Mike set up on SG-14

1130 Drillers finish installation &

leave materials for 4th w/ Lisa

1200 Lisa samples MW-8. Cleans

up site.

1215 Lisa joins Erin & Mike while doing leak check, helium

1240 canister runs out of gas.

1230 Lisa to Air Gas to get full canister. Full canister has 2200 psi He. Erin says original canister only had 500 psi.

1320 Lisa arrives back at site.

Erin & Mike had enough He to finish sample. Cleaned up & took lunch break. Lisa & Mike eat on site.

1415 Back at site. Set up & sample SG-11 & SG-12.

1800: Clean up & leave site.

1830: Demob

1900: End of field day

4/29/11 (cont'd)

Soil Gas Sample & Leak Check Note
SG-14 (near office door of PIP Printer)

1-L Summa canister & 4-min flow controller

Manifold leak check: Held 15" Hg

Helium leak check: 0 ppm He

Insufficient gas to take RKL Reading

SG-11 (inside fenced area)

1-L Summa canister & 4-min flow controller

1310 SG-14 Sample ID: 11-4AG-025-SG

Canister: 2145

Initial vacuum: 29 in. Hg

Final vacuum: 5 in Hg

SG-11 (inside fenced area)

1-L Summa canister & 4-min flow controller

Manifold leak check: Held 15" Hg

Helium leak check: 0 ppm He

Hex 180 ppm

O₂ 19.9%

CO₂ 1.4%

H₂S 0.0 ppm

1540 SG-11 Sample ID: 11-4AG-022-SG

Canister: 2366

Initial vacuum: 29" Hg

Final vacuum: 5" Hg

Len M

4/29/11 (cont'd)

SG-12 (in front of PIP printing garage door - (deep))

1-L Summa canister & 4-min flow contr.

Manifold leak check: Held 15" Hg

Helium leak check: 0.0 ppm He

Hex: 250 ppm

O₂: 18.5%CO₂: 2.1%H₂S: 0.0 ppm

1725 SG-12 Sample ID: 11-4AG-023-SG

Canister: 35670

Initial vacuum: 30" Hg

Final vacuum: 5" Hg

5/2/11 L. Nicholson

Weather: 44° F; Sunny;

1300 - Arrive site. Decon pump & change bladder. More complicated than originally thought.

- Safety "meeting" - just myself

1450 - Start developing ^{MW-9} - do not get continuous flow - many "bubbles" in tubing

1505 Calibrate YSI - see below:

pH 7.04

Parameter	Initial	Final	Range?
pH 7.04	6.93	7.04	N
pH 4.00	4.01	4.00	N
pH 10.11	9.99	10.11	N
Spec. Cond (1413)	1.258	1.413 ^{ms/cm}	N
ORP (240 mV)	233.4	240.0 mV	N
DO%	103.3	99.3	N

1550 MW-9 has cleaned up. Turn pump off to allow well to recharge

1600 Well recharged to original DTW.

start & low-flow sampling

1700 Collected

1640 Collected sample from MW-9 with dup.

Finish sampling - pull & decon pump.

Replace bladder. Demob → move to MW-11.

5/2/11 L. Nicholson (cont'd)

1750 Set up on MW-11 to start develop

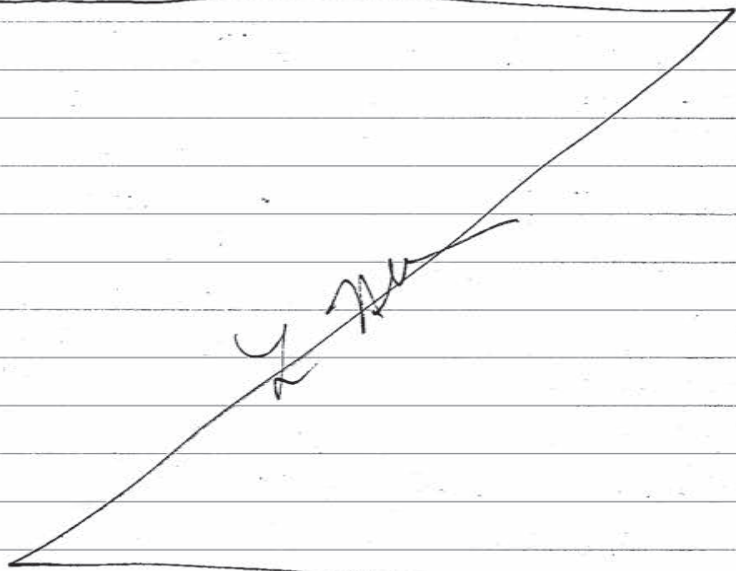
1800 Start pumping at ~160 mL/min.

1915 MW-11 completely cleaned up - running clear. Shut off pump to recharge. Recharges to initial DTW (43.02') within ~30 secs. Start low-flow sampling.

1945 Sample MW-11 with MS & MSD (9 VOAs total)

Finish sampling; clean up, decon pump & change bladder; decon YSI.

2050 Leave site End of field day



5/3/11 L. Nicholson

Weather: 37°; calm; overcast.

0715 Calibrate YSI -

Parameter	Initial	Final	O/R
pH 7.00	7.23	7.00	N
pH 4.01	4.04	4.01	N
pH 10.00	9.94	10.00	N
Spec Cond 1.413	1.388	1.413	N
ORP 240	236.6	240.0	N
DO%	96.3	97.8	N

0745 Finish calibration. Drive to site

0820 Arrive site. Set up to develop & sample MW-10.

0855 Start pumping MW-10 to develop

0945 Well has cleaned up and is running clear. Start low-flow sampling

1010 Collect sample MW-10; clean up - move back to MW-9 to get better DO reading

~~1035 Move~~

1050 Start pumping on MW-9

1125 Clean up; decon all water sampling equipment, dump water & PPE in drums.

5/3/11 (cont'd)

1230 Lunch (off-site)

1330 At office. Demob water sampling & mob for soil gas sampling

1500 At site. Set up to sample SG-7 and SG-8. Calibrate RKI Eagle.

~~SG-8~~

SG-7 (shallow, S of church)

1-L Summa can. and 4-min. flow contr.
Manifold leak check: Held 15 in Hg
Helium leak check: 0.0 ppm He

Hex: 1% LEL

O₂: 20.7% O₂CO₂: 0.5% CO₂

1700 SG-7 Sample ID: 11-4AG-018-SG

Canister: 9311

Initial vacuum 30" Hg

Final vacuum 5" Hg

1710 Set up on SG-8 (10', S. of church)

1-L Summa canister & 4-min flow controller.
Manifold leak check: Held 15" Hg.
Helium leak check: 0.0 ppm

Hex: 1% LEL

O₂: 19.8%CO₂: 1.1%

5/3/11 (cont'd)

~~SG-8~~

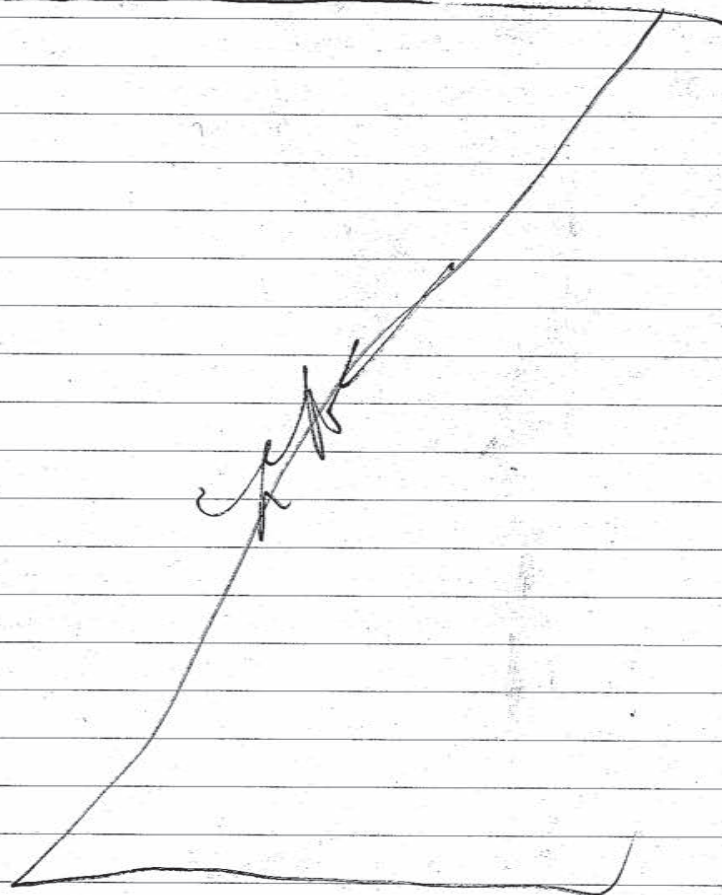
1810 SG-8 Sample ID: 11-4AG-019-SG

Canister: 35562

Initial vacuum: 29.5" Hg

Final vacuum: 5" Hg

1840 cleaned up - leave site



5/4/11. L. Nicholson

0830 Calibrate RKI

0900 Return rented bladder pump & accessories to TTT Environmental

0920 At office. Pack water samples for shipment to OnSite Environmental via Goldstreak

1115 Ship samples

1200 Arrive site - at church - set up to sample SG-5 on west side of church.

SG-5 1-L Summa can. w/4-min flow contr. manifold leak check: Held 15" Hg
Helium leak check 0.0 ppm
Hex: 1% LEL

O₂: 20.9%

CO₂: 0.7% H₂: 0.0 ppm

1335 SG-5 Sample ID: 11-4AG-D16-SG
Canister: 31774

Initial vacuum: 29.5" Hg

Final vacuum: 29.5" Hg

1400 SG-5 Duplicate ID: 11-4AG-026-SG
Canister: 37303

Initial vacuum: 29.5" Hg

Final vacuum: 5" Hg

See pg

5/4/11 (cont'd)

1410 Set up to sample SG-6 on east side of church - need access - locked gate.

SG-6 1-L Summa w/4-min flow contr.
Manifold leak check: Held 15" Hg
Helium leak check: 0.0 ppm He
Hex: 1% LEL

O₂: 20.4%

CO₂: 1.3%

1520 SG-6 Sample ID: 11-4AG-D17-SG

Canister: 36450

Initial vacuum: 29.5" Hg

Final vacuum: 9" Hg

Note: when preparing to open canister valve, noted that flow controller read 5" Hg. Closed valve at 9" Hg after 4 minutes had elapsed.

1620 Setup to sample SG-13 on southwest side of PIP printing building

SG-13 1-L Summa w/4-min flow controller
Manifold leak check: Held 15" Hg
Helium leak check: 0.0 ppm

Hex: 1% LEL

O₂: 19.3%

CO₂: 1.9%

See pg

5/4/11 cont'd.

~~SG-13~~

1755 SG-13 Sample ID: 11-4AG-024-SG

Canister: 2063

Initial vacuum: 29" Hg

Final vacuum: 5" Hg

1830

1830 Move to SG-10. ~~Set~~ (next to SG-12) (shallow) SG-10 is shallow (4' deep).

SG-10 1-L Summa w/ 4-min flow control (200 mL/minute)

manifold leak check: Held 15" Hg

Helium leak check: 0.0 ppm He

Hex: 1% LEL

O₂: 18.8%CO₂: 2.3%

1915 SG-10 Sample ID: 11-4AG-021-SG

Canister: 37433

Initial vacuum: 28.5 (from flow ctrl)

Final vacuum: 5" Hg

Finish sampling - cleanup site & equipment. Demob

2010 Leave site.

H. H. H.

5/5/11 L. Nicholson

1500 Prepare to ship samples.

Label Canister 35561 as trip blank

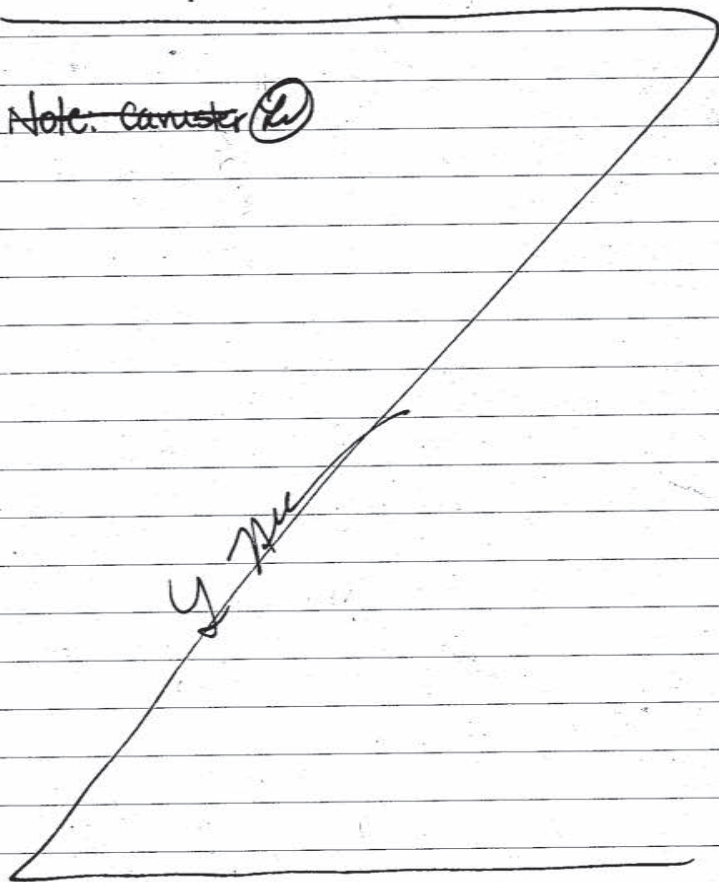
Initial/Final vacuum: 29" Hg

wait to discuss installation

& sampling of SG-9 with

Todd Blessing before shipping samples.

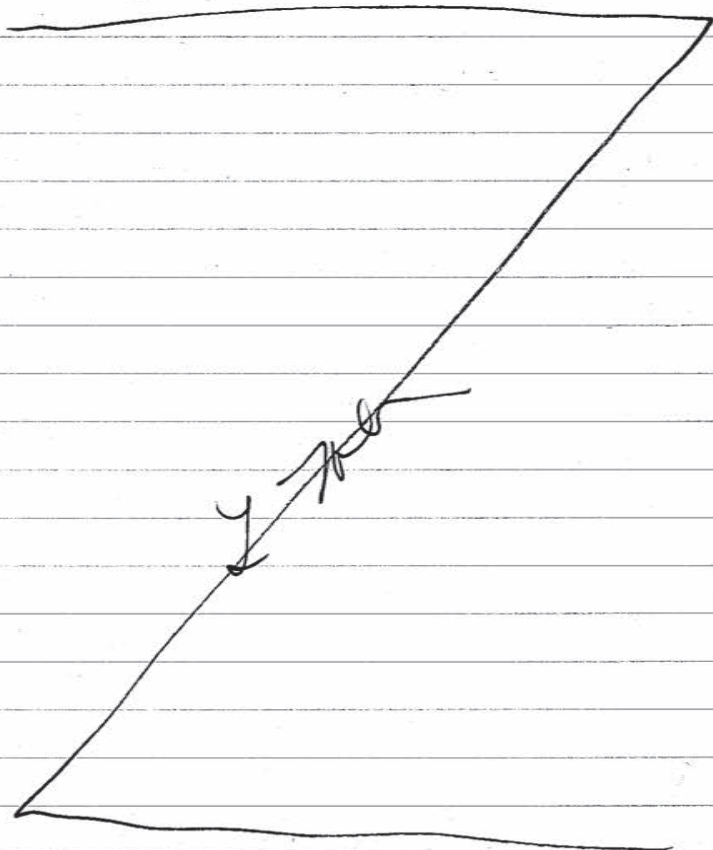
Note: Canister (2)



5/11/11 L. Nicholson

1730 Drive to Kendall Toyota employee parking lot (Fenced lot) to check on drums. Water drum is slightly dented but is not leaking. All drums look good.

2 soil drums, 1 water drum, 1 PPE drum.

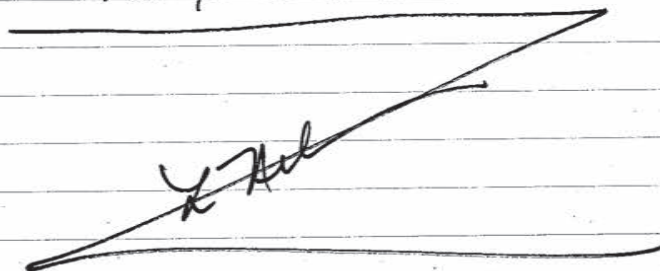


5/16/11

1330 Mike Helms meets Discovery Drilling at fenced parking lot to have them move drums of soil to Lot 4 & dump/spread clean soil in depression from previous foundation (per John Tatham's request - PIP Printing owner).

Kendall Toyota employees are parked in front of the drums. Mike goes to Kendall Toyota to ask that the vehicle(s) be moved. No one is willing to have them moved.

Mike & Discovery roll the drums out to the middle away from the cars to load them up & move them. They then spread the soil in lot 4.



5/24/11 L. Nicholson

1400 Meet Emerald at Kendall Toyota
parking lot to sign manifest
to pick up & pick up, transport, and
dispose of non-regulated purge
water and sampling supplies.

Sample ID's 11-4AG-xxx-50 (GW, SG)

Soil samples (50)

ID ^{Locat.} Depth Date Time

001

002

003

004

005

006

007

008

009

010

Groundwater Samples (GW)

011

012

013

014

015

TB-04

Sample ID's 11-4AG-xxx-(SO, GW, SG)
Soil Samples (SO)

ID	Location	Depth	Date	Time
001	MW-8	19.6-20.8	4/27/11	1000
002	"	46.4-47.0	4/27/11	1150
003	MW-9	19-20	4/26/11	1630
004	"	40-41	4/26/11	1745
005	MW-10	17-18	4/25/11	1600
006	"	37-38	4/25/11	1725
007	MW-11	20-21	4/26/11	1140
008	"	41.0-41.8	4/26/11	1340
009 (dup)	MW-8	46.4-47.0	4/27/11	1200
010	Trip Blank			

Groundwater Samples (GW)

ID	Well ID	Date	Time	Notes
011	MW-8	4/29/11	1210	
012	MW-9	5/2/11	1640	
013	MW-10	5/3/11	1010	
014	MW-11	5/2/11	1945	
015	MW-9	5/2/11	1700	Dup
TB-04	Trip Blank			

Sample ID's (cont'd) 11-4AG-xxx-SG
Soil Gas Samples (SG)

ID	Gas Point ID	Date	Time	Notes
016	SG-5	5/4/11	1335	
017	SG-6	"	1520	
018	SG-7	5/3/11	1700	
019	SG-8	"	1810	
020				
021	SG-10	5/4/11	1915	
022	SG-11	4/29/11	1540	
023	SG-12	4/29/11 5/4/11	1725	
024	SG-13	5/4/11	1755	
025	SG-14	4/29/11	1310	
026 (dup)	SG-5 (dup)	5/4/11	1400	Dup taken at same time as SG-5
TB-03	Trip Blank			

Y. Chen

11/16/11

4TH # GAMBELL 12F # VERY WINDYM. TELAND
E. McDONALD15:30 OASIS ON SITE. CALLED PASTOR LANE
HE LEFT GATE OPEN FOR US TO ACCESS SG-6.

15:45 CONDUCTED TAILGATE SAFETY MEETING.

16:15 RIGGED UP ON SG-6. 1 L SUMMA # 4 MIN

FLOW CONTROLLER. (EAST SIDE OF CHURCH)

MANIFOLD LEAK CHECK: HELD 15" Hg

HELIUM LEAK CHECK: 0.0 ppm

GM HEX: CH₄ LEL: 0%O₂: 20.6% VOLCO₂: 1.08% VOL

17:00 SG-6 SAMPLE ID: 11-4AG-027-SG

CANISTER: 12392

INITIAL VAC: 28.6

FINAL VAC: 5" Hg

17:40 OASIS OFFSITE.

11/17/11

4TH # GAMBELLM. TELAND
E. McDONALD
15F VERY WINDY

09:20 OASIS ON SITE. CHECK IN W/PIIP

PRINTING TO LET THEM KNOW WE WILL BE

SAMPLING & MAY NEED VERTICOLE MOVED

FOR MONUMENT ACCESS. LOCATE SG-10 & SG-12

09:45 RIG UP ON SG-12 W/ 1 L SUMMA # 4 MIN

FLOW CONTROLLER. (EAST SIDE OF PIP, DEEP)

MANIFOLD LEAK CHECK: HELD 15" Hg

HELIUM LEAK CHECK: 0 ppm

10:15 SG-12 SAMPLE ID: 11-4AG-028-SG

CANISTER: 37663

INITIAL VAC: 27.9" Hg

FINAL VAC: 5" Hg

CHECKED TEFLAR BAK W/KKI

CH₄: 0% LELO₂: 18.2% VOLCO₂: 2.12% VOL

10:30 RIG UP ON SG-10 W/ 1 L SUMMA

4 MIN FLOW CONTROLLER (EAST SIDE
PIP, SHALLOW)

MANIFOLD LEAK CHECK: HELD 15" Hg

HELIUM LEAK CHECK: 0.0 ppm

11:10 RIG SG-10 SAMPLE ID: 11-4AG-029-SG

CANISTER: 11441

INITIAL VAC: 30.0" Hg

FINAL VAC: 5" Hg

CH₄: 0% LEL O₂: 19.7% CO₂: 1.32% VOL

11/17/11

4th # GAMBELLE. McDONALD
215 # SUNDY11:30 RIG UP ON SG-14 w/ 2 L SUMMA &
4 MINUTE FLOW CONTROLLER. (EAST EAST)

MANIFOLD LEAK CHECK = 15" Hg (HELD)

HELIUM LEAK CHECK = 0.0 ppm

12:00 SG-14 SAMPLE ID: 11-4AG-030-SG

CANISTER: 37405

INITIAL VAC: 30.0" Hg

FINAL VAC: 5" Hg

CH₄: 1% VOL O₂: 17.9% VOL CO₂: 1.80% VOL

12:15 OASIS OFFSITE FOR LUNCH.

13:15 ONSITE.

13:20 RIG UP ON SG-13 w/ 2 L SUMMA &

4 MIN FLOW CONTROLLER. NOTE: SG POINT

TUBING WAS TIED & FLANGED TO PIP

PRINTING FENCE (NO MONUMENT). (WEST PIP)

MANIFOLD LEAK CHECK: HELD 15" Hg

HELIUM LEAK CHECK: 0.0 ppm

14:00 SG-13 SAMPLE ID: 11-4AG-031-SG

CANISTER: 37428

INITIAL VAC: 30" Hg

FINAL VAC: 5" Hg

CH₄: 1% VOL O₂: 20.7% VOL CO₂: 1.36% VOL

14:15 RIG UP ON SG-11 w/ 2 L SUMMA &

4 MINUTE FLOW CONTROLLER. (NW PIP)

MANIFOLD LEAK CHECK: HELD 13" Hg

C-2

11/17/11 4th # GAMBELL

HELIUM LEAK CHECK: 0.0 ppm

15:15 SG-11 SAMPLE ID: 11-4AG-032-SG

CANISTER: 34670

INITIAL VAC: 29.6

FINAL VAC: 5" Hg

15:30 SG-11 (DUPE) ID: 11-4AG-033-SG

CANISTER: 35561

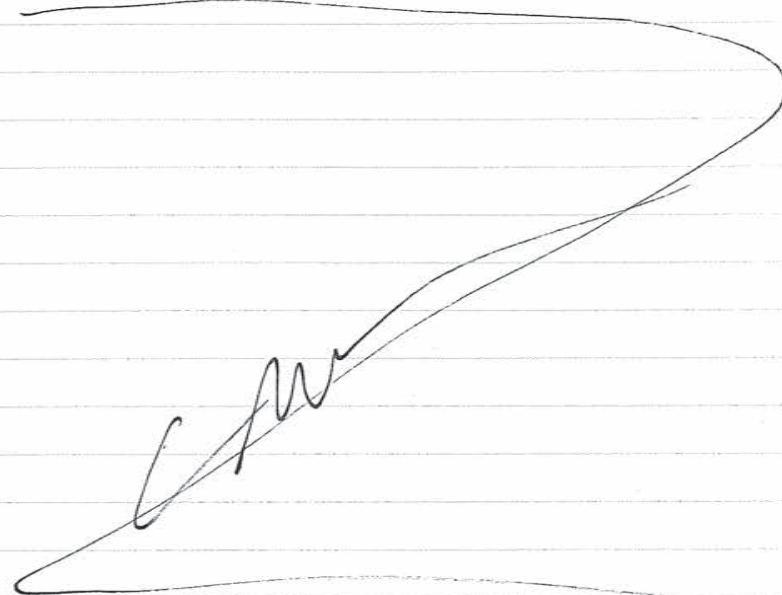
INITIAL VAC: 29.4

FINAL VAC: 5" Hg 7" Hg

CH₄: 0% VOL O₂: 20.9% VOL CO₂: 0.98% VOL

16:00 HAD DIFFICULT TIME LOCATING

LAST 3 WELLS. OASIS OFFSITE.



11/18/11

4TH & GAMBELL

M. TIELINS
E. McDONALD
- 41°F

0800 OASIS ONSITE. CONDUCT TAILGATE
SAFETY MEETING & A LOOK FOR SG-5. CALL
L. NICHOLSON BECAUSE UNABLE TO LOCATE
SG-5. CALL SURVEYOR STELLY & GET
SWING TIES. SG-5 MONUMENT COVER
IS MISSING, STEEL CASING PACKED
WITH SNOW.

0850 RIG UP ON SG-7 (SHALLOW WELL
ON SOUTH SIDE OF CHURCH) W/ 1 L
SUMMA & 4 MIN FLOW CONTROLLER.

MANIFOLD LEAK CHECK = HELD 15" Hg

HELIUM LEAK CHECK = 700ppm = PASS

09:40 SG-7 SAMPLE ID: 11-4AG-034-SG

CANISTER: 34663

INITIAL VAC: 29.6" Hg

FINAL VAC: 5" Hg

CH₄: 0% LEL CO₂: 0.50% O₂: 20.5% VOL

NOTE: ~~Due to~~ HELIUM DETECTOR
WOULD NOT READ 0.0ppm, POSSIBLY
DUE TO COLD TEMPS. MOVED TO
TRUCK BETWEEN SAMPLES TO WARM UP.

NOTE: WHEN DEFLATING TEPAL BAG
APPEARED THESE READINGS ARE
BROKEN DUE TO INSUFFICIENTLY
CLOSED VALVE.

11/18/11

4TH & GAMBELL

09:50 RIG UP ON SG-8 (SOUTH SIDE CHURCH,
DEEP) W/ 1-L SUMMA & 4 MIN FLOW CONTROLLER
MANIFOLD LEAK TEST: HELD 15" Hg

HELIUM LEAK TEST: 0.0ppm

10:15 SG-8 SAMPLE ID: 11-4AG-035-SG

CANISTER: 36452

INITIAL VAC: 30.0" Hg

FINAL VAC: 5" Hg

CH₄: 0% LEL O₂: 20.9% VOL CO₂: 1.24% VOL

10:30 RIG UP ON SG-5 (WEST SIDE OF CHURCH)
W/ 1 L SUMMA & 4 MIN FLOW CONTROLLER

MANIFOLD LEAK TEST = HELD 15" Hg

HELIUM LEAK TEST = 0.0ppm

11:10 SG-5 SAMPLE ID: 11-4AG-036-SG

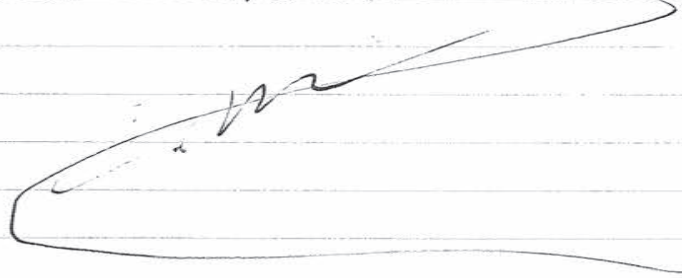
CANISTER: 35619

INITIAL VAC: 29.4" Hg

FINAL VAC: 5" Hg

RKI WAS ACTING UP, POSSIBLY DUE TO
COLD SO DID NOT COLLECT PARAMETERS

11:30 OASIS OFFSITE.



11/18/11

4TH & GAMBELL

SAMPLE SUMMARY

SAMPLE ID	TIME	LOCAL	CAN ID	IN/FIN VAC (%)	DATE
11-4AG-					
-027-SG	1700	SG-6	12392	28.6/5	11/14/11
-028-SG	1015	SG-12	37663	29.9/5	11/17/11
-029-SG	1110	SG-10	11441	30.0/5	
-030-SG	1200	SG-14	37405	30.0/5	
-031-SG	1400	SG-13	37428	30.0/5	
-032-SG	1515	SG-11	34670	29.6/5	
-033-SG	1530	(DUPE) SG-11	35561	29.4/7	
-034-SG	0940	SG-7	34663	29.6/5	11/18/11
-035-SG	1015	SG-8	36452	30.0/5	
-036-SG	1110	SG-5	35619	29.4/5	

ALL SAMPLES SUBMITTED FOR ANALYSIS
BY MODIFIED TO-15 TO AIR TORRES.

PHOTO LOG

- ① SG-13 MONUMENT WAS DESTROYED. PENCE
PLACING TO INDICATE LOCATION.
- ② SG-5 MONUMENT COVER (CLOSE UP)
- ③ SG-5 MONUMENT COVER MISSING

Initial DTW =
44.75Initial DTW =
47.56

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project #: 14-200-02-1 Well ID: MW-9
 Date: 5/2/11
 Project Name: 2011 4th & Gamble Start Time: 1400
 Site: MW-9(4) Near church End Time: 1730
 Field Team:
 Sample ID: 11-4AG-012-GW Time: 1640 primary dup split ms/msd
 Sample ID: 11-4AG-015-GW Time: 1700 primary dup split ms/msd
 Sample ID: Time: primary dup split ms/msd

Weather Conditions: 48°F, 5 mph - 10 mph wind from west, partly cloudy.

Depth to Top of Product (ft BTOC): N/A Depth to Water (ft BTOC): 44.76
 Depth to Oil/Water Interface* (ft BTOC): Total Depth (ft BTOC): 47.56

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	3% (min ±0.2°C)	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
ORP	± 1999 mV	± 10%	
Dissolved Oxygen	0-19.99 mg/L	± 10%	
Turbidity	0-800 NTU	± 10%	

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp 8°C	pH	Conduct'ity µS/cm	Turbidity (NTUs)	* DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw- down
1	1610	8.00	6.97	445	moderate	13.05	209.5	lt. gry.	None	44.95	0.19
2	1620	7.91	6.99	444	low	11.86	163.9	clear	None	44.87	0.11
3	1624	7.78	6.92	442	low	11.83	156.8	clear	None	44.89	0.13
4	1628	7.66	6.93	440	low	12.34	141.6	clear	None	44.87	0.11
5	1632	7.58	6.89	440	low	12.93	137.8	clear	None	44.89	0.13
6	1636	7.51	6.88	439	low	12.22	132.3	clear	None	44.87	0.11
7				stable	sample						
8	1113										
5/3/11	1108	7.03	6.31	441	low	6.66	-23.9	clear	None		
10	1116	6.97	6.30	438	"	6.51	-41.1	"	"		
11	1120	6.95	6.30	444+437	"	6.46	-44.5	"	"		
12	1123	6.96	6.30	437	"	6.37	-46.3	"	"		

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
VOCs	2 @ 6	Duplicate collected here
		*DO reading erroneous - bubbles coming up tubing.
		Note: Repurged on 5/3/11 to get good reading (no bubbles)

Signed: Ben R

Date: 5/2/11

Signed/reviewer:

Date:

Initial DTW = 44.34

Initial DTB =
48.50

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project #: 14-200-02-1
 Project Name: 2011 4th & Gamble
 Site: N. side PIP Printing
 Field Team:
 Sample ID: 11-4AG-013-GW Time: 1010 primary dup split ms/msd
 Sample ID: Time: primary dup split ms/msd
 Sample ID: Time: primary dup split ms/msd

Well ID: MW-10

Date: 5/3/11

Start Time: 0945

End Time: 1230

Weather Conditions: 43°F; slight breeze from N; overcast.

Depth to Top of Product (ft BTOC):

Depth to Water (ft BTOC):

Depth to Oil/Water Interface* (ft BTOC):

Total Depth (ft BTOC):

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	3% (min ± 2°C) (0.2)	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
ORP	± 1999 mV	± 10%	
Dissolved Oxygen	0-19.99 mg/L	± 10%	
Turbidity	0-800 NTU	± 10%	

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Refill 11

Instrument Observations Note: Set bladder pump contr. 4 cycles/min Flow ID = 101 Disch. 4

Round	Time	Temp °C	pH	Conduct'ity (µS/cm)	Turbidity (NTUs) ^{very low}	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
1	0954	6.99	6.28	562	none	5.17	136.7	clear	None	44.38	0.03
2	0958	6.95	6.24	561	very low	4.17	75.0	clear	None	44.38	0.03
3	1002	6.95	6.24	560	very low	4.11	17.6	clear	None	44.38	0.03
4	1006	6.89	6.24	560	very low	4.11	-4.9	clear	None	44.38	0.03
5	1009	6.85	6.24	560	very low	4.06	-5.6	clear	None	44.38	0.03
6	1010			stable	start sampling						
7											
8											
9											
10											
11											
12											

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
VOCs	80 3	Note: ORP slowed down decrease significantly fast reading ORP stabilized by last reading

Signed: Lisa Nish

Date: 5/3/11

Signed/reviewer:

Date:

Initial DTW = 43.02

Initial
DTB = 46.55

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project #: 14-200-02-1
 Project Name: 2011 4th & Gamble
 Site: Kendall Motors Parking Lot
 Field Team: Lisa Nicholson
 Sample ID: 11-4AG-014-GW
 Sample ID: _____
 Sample ID: _____

Well ID: MW-11
 Date: 5/2/11
 Start Time: 1800 (1915)
 End Time: 1740

Time: 1945 primary dup split ms/msd
 Time: primary dup split ms/msd
 Time: primary dup split ms/msd

Weather Conditions: 48°C; partly cloudy; slight breeze from west.

Depth to Top of Product (ft BTOC): _____
 Depth to Oil/Water Interface* (ft BTOC): _____
 * Note: Same as depth to water

Depth to Water (ft BTOC): 43.02
 Total Depth (ft BTOC): 46.55

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	3% (min ± 2°C)	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
ORP	± 1999 mV	± 10%	
Dissolved Oxygen	0-19.99 mg/L	± 10%	
Turbidity	0-800 NTU	± 10%	

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
 Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
 Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conduct'ity (µS/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
1	1923	7.57	?	550	very low	10.33	45.3	clear	None	43.10	0.08
2	1928	7.50	6.49	548	"	7.79	25.2	"	None	43.06	0.04
3	1932	7.52	6.52	548	"	7.62	23.5	"	"	43.06	0.04
4	1937	7.38	6.55	546	"	7.47	26.0	"	"	43.06	0.04
5	1942	7.26	6.50	544	"	7.51	29.1	"	"	43.06	0.04
6				stable	start sampling						
7											
8											
9											
10											
11											
12											

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
VOCs	9 (ms/msd)	Good recharge

Signed: Lisa Nicholson

Date: 5/2/11

Signed/reviewer:

Date:

45.11 prior to
development

47.22 to bottom

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Project #:	14-200-02-1	Well ID:	MW-8		
Project Name:	2011 4th & Gamble	Date:	4/29/11		
Site:		Start Time:	1125		
Field Team:	L. Nicholson; M. Helms; E. McDonald help call 6 YSI	End Time:	1200		
Sample ID:	11-4AG-011-GW	Time:	1210	primary	dup split ms/msd
Sample ID:		Time:		primary	dup split ms/msd
Sample ID:		Time:		primary	dup split ms/msd

Weather Conditions: 40°F, slight north wind, clear

Depth to Top of Product (ft BTOC):	40	Depth to Water (ft BTOC):	45.11
Depth to Oil/Water Interface* (ft BTOC):		Total Depth (ft BTOC):	47.22

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	3% (min ± 2°C)	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
ORP	± 1999 mV	± 10%	
Dissolved Oxygen	0-19.99 mg/L	± 10%	
Turbidity	0-800 NTU	± 10%	

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:

Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown

Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Round	Time	Temp °C	pH	Conductivity (µS/cm)	Turbidity (NTUs) @	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
1	1140	6.36	6.29	308	mod	10.08					
2	1144	6.45	6.23	306	cleaning up	7.04	-53.6	gray	none		
3	1148	6.48	6.22	306	low - mod	5.63	-73.4	light gray	none		
4	1158	6.52	6.21	306	low	4.27	-101.2	light gray	none		
5	1157	6.53	6.20	306	low	3.59	-116.7	clear	none		
6	1201	6.54	6.20	306	low	3.04	-121.6	clear	none		
7	1207	6.53	6.20	306	low	2.69	-127.4	clear	none		
8											
9											
10											
11											
12											

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
VOCs	3	unable to measure DTW with pump in well - recharge is good thing

Signed:	<u>[Signature]</u>	Date:	5/3/11
Signed/reviewer:		Date:	

APPENDIX B

Photographs

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PHOTOGRAPH 1: DRILLING MW-8 ON THE CORNER OF 3RD AND HYDER.



PHOTOGRAPH 2: MONUMENT FOR MW-9 AT SOUTHEAST CORNER OF FIRST NATIVE BAPTIST CHURCH (LOOKING NORTH).



PHOTOGRAPH 3: MONUMENT FOR MW-10 IN GRAVEL PARKING AREA NORTH OF PIP PRINTING (LOOKING SOUTHWEST).



PHOTOGRAPH 4: COLOR-TEC® SCREENING FROM BACK OF VEHICLE. CHURCH IN BACKGROUND.



PHOTOGRAPH 5: NOVEMBER SOIL GAS SAMPLING; SG-5 ON WEST SIDE OF CHURCH MISSING MONUMENT COVER. SOIL GAS TUBING STILL INTACT.



PHOTOGRAPH 6: MONUMENT FOR SG-13 DESTROYED. SOIL GAS TUBING STILL INTACT AND SHOWN WITH PINK FLAGGING (LOOKING SOUTHWEST)

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APPENDIX C

Survey Data

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Mammoth Consulting, L.L.C.
Land Research ♦ Surveying ♦ Mapping ♦ Development Consulting
11001 Ridgecrest Drive Anchorage AK 99516
Tele. (907) 346-3767

November 29, 2011

OASIS Environmental, Inc.
825 W 8th Avenue
Anchorage AK 99501

Attn: Lisa Nicholson

Re: 4th and Gambell Survey

Dear Lisa:

Submitted herewith is the survey data for the above project. The survey was performed on November 5 and 13, 2011, using realtime kinematic (RTK) GPS, post-processed carrier phase differential GPS, and trigonometric leveling methods. Two Sokkia GRX1 dual-frequency GNSS receivers with integrated antennae and a Sokkia SHC250 field controller with Spectrum Survey Field software were used to collect the GPS data. A Topcon GTS 701 total station was used for the trig levels.

GPS Base Station: A nail set 0.1' below ground surface and designated "HYDER" was used as the GPS base station. The coordinate and elevation for HYDER were determined using OPUS (Online Positioning Users System, NGS) and data from a two-hour occupation. The horizontal datum was NAD83(CORS96)(EPOCH:2002.0000), and the vertical datum, NAVD88 using GEOID09.

Monitoring Wells: A total of seven (7) monitoring wells were surveyed. Coordinates of the measuring marks on the PVC pipes were determined using RTK GPS for five of the wells. At the other two wells, where "fixed" RTK solutions could not be obtained, the coordinates were determined by post-processing eight minutes of data using Topcon Tools software.

Elevations at the measuring marks were determined using trig leveling methods that included repeat measurements (once in direct mode and once in reverse mode) and with the instrument re-leveled between measurements and are reported to the nearest 0.01 foot.

The ground elevation at each of the five flush mount wells MW-07 thru MW-11 was computed by adding the distance between the PVC pipe and ground level to the PVC elevation. The ground elevations at MW-05 and MW-06 were computed by adding the distance between the PVC pipe and the top of monument to the PVC elevation and subtracting the "stick-up." Ground elevations are reported to the nearest 0.1 foot.

Soil Gas Points: A total of nine (9) soil gas points were surveyed. Coordinates and elevations of the centers of the monument covers were determined using RTK for five of the soil gas points. At the other four, where “fixed” RTK solutions could not be obtained, the coordinates and elevations were determined by post-processing four to eleven minutes of data. These elevations are reported to the nearest 0.1 foot.

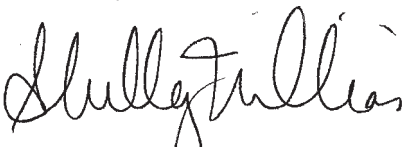
Miscellaneous Points: Selected corners of the First Native Baptist Church and PIP Printing buildings were tied to the GPS points using conventional surveying methods (i.e. total station).

GPS Accuracies: Included on the attached point list are statistics associated with each of the GPS positions: horizontal and vertical root-mean-square (HRMS and VRMS) and horizontal, vertical, and positional dilutions of precision (HDOPs, VDOPs, and PDOPs). These values reflect the expected spread of results, or precision, of each vector measured between the base station and the rover. DOP’s are related to satellite geometry, with lower values indicating higher precision. The National Geodetic Survey (NGS) recommends maximum PDOP’s of 2, 3, 4, and 6 for surveys with targeted horizontal precisions of 0.01-0.02 m, 0.02-0.04 m, 0.04-0.06 m, and 0.1– 0.2 m, respectively. RMS values are related to the noise of the satellite ranging observables and are the precision of the vector measurement at the 1-sigma or 68% confidence level. Doubling this value yields the precision at the 95% confidence level. With a base station considered as coordinate “truth,” these precisions are also the measurement of local accuracy.

The PDOPs for the 4th and Gambell survey ranged from 1.5 to 3.0. The HRMS’s ranged from 0.004 to 0.085 feet, indicating coordinate precisions (and local accuracies) of 0.01 to 0.17 feet (or 0.002 to 0.05 m) at the 95% confidence interval.

Thank you for the opportunity to perform this work. Please call if you have any questions or require additional information.

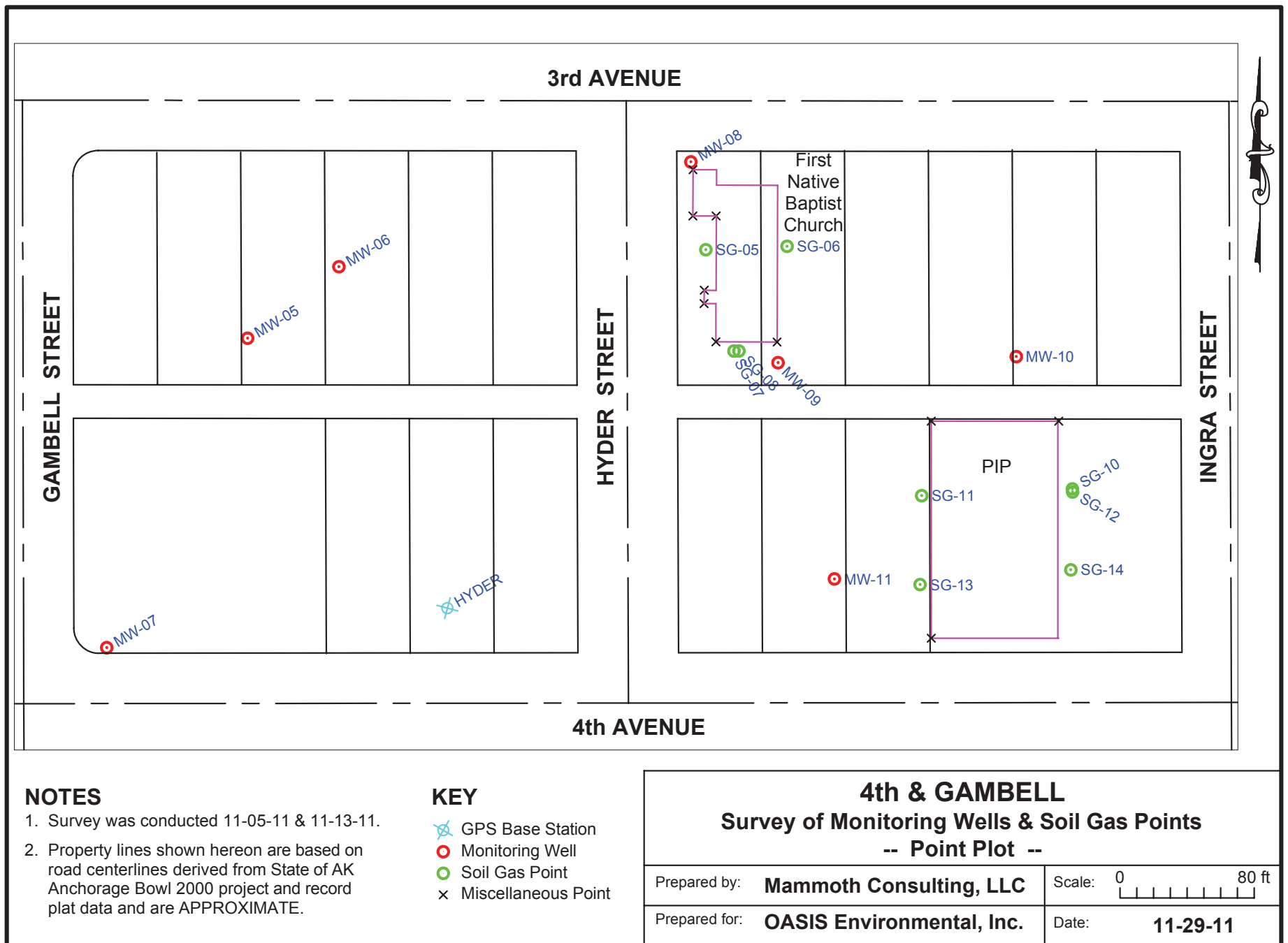
Sincerely,



Shelley Williams, P.L.S.

Attachments:

- Point Plot
- Point List



NOTES

1. Survey was conducted 11-05-11 & 11-13-11.
2. Property lines shown hereon are based on road centerlines derived from State of AK Anchorage Bowl 2000 project and record plat data and are APPROXIMATE.

KEY

- X GPS Base Station
- Monitoring Well
- Soil Gas Point
- x Miscellaneous Point

4th & GAMBELL Survey of Monitoring Wells & Soil Gas Points -- Point Plot --

Prepared by: **Mammoth Consulting, LLC**

Prepared for: **OASIS Environmental, Inc.**

Scale: 0 80 ft

Date: **11-29-11**

4th & Gambell Monitoring Wells and Soil Gas Points Data for Survey Conducted November 5 & 13, 2011 by Mammoth Consulting													
	NAD83 (CORS96) (EPOCH:2002.0000)												
			AK State Plane Zone 4		NAVD88 Elev		Description	Type of position	HDOP	VDOP	PDOP	HRMS	VRMS
Pt. No.	Latitude	Longitude	Northing	Easting		Gnd at MW							
	(DD.MMSSSSSS)	(DDD.MMSSSSSS)	(U.S. Survey Feet)						(Feet)				
1	61.130732721	-149.521046770	2637377.54	1663407.85	122.44		HYDER	OPUS Control Point	Position is from 2-hour occupation. Estimated Std Dev's were: 0.013 ft (Lat), 0.030 ft (Lon), 0.082 ft (Height)				
2	61.13089145	-149.52128941	2637538.48	1663288.72	124.97	122.4	MW-05	PHASE_DIFF_FIXED	1.503	1.911	2.431	0.042	0.032
3	61.13093334	-149.52117795	2637581.13	1663343.21	124.52	122.4	MW-06	PHASE_DIFF_FIXED	1.514	1.916	2.442	0.039	0.034
4	61.13070989	-149.52146160	2637353.95	1663204.77	120.67	121.2	MW-07	PHASE_DIFF_FIXED	1.493	1.907	2.422	0.037	0.032
5	61.13099449	-149.52074934	2637643.64	1663552.96	122.18	122.6	MW-08	POST-PROCESSED-DGPS	0.898	1.484	1.734	0.026	0.032
6	61.13087649	-149.52064371	2637523.92	1663604.92	122.61	123.0	MW-09	PHASE_DIFF_FIXED	0.929	1.305	1.602	0.025	0.024
7	61.13087974	-149.52035352	2637527.51	1663747.01	121.04	121.5	MW-10	POST-PROCESSED-DGPS	0.754	1.376	1.569	0.004	0.007
8	61.13074943	-149.52057548	2637394.97	1663638.59	121.91	122.3	MW-11	PHASE_DIFF_FIXED	1.087	1.649	1.975	0.014	0.016
9	61.13094292	-149.52073127	2637591.29	1663561.91	122.2		SG-05	POST-PROCESSED-DGPS	0.990	1.913	2.154	0.021	0.031
10	61.13094484	-149.52063230	2637593.34	1663610.37	123.3		SG-06	POST-PROCESSED-DGPS	0.876	1.677	1.892	0.021	0.030
11	61.13088336	-149.52069733	2637530.85	1663578.65	122.8		SG-07	PHASE_DIFF_FIXED	1.462	1.861	2.366	0.027	0.030
12	61.13088344	-149.52069127	2637530.93	1663581.62	123.0		SG-08	PHASE_DIFF_FIXED	1.463	1.862	2.368	0.024	0.020
13	61.13080205	-149.52028561	2637448.69	1663780.42	122.6		SG-10	PHASE_DIFF_FIXED	1.737	2.290	2.874	0.022	0.030
14	61.13079819	-149.52046902	2637444.59	1663690.62	123.1		SG-11	POST-PROCESSED-DGPS	1.080	1.757	2.062	0.042	0.071
15	61.13080016	-149.52028535	2637446.77	1663780.55	122.7		SG-12	PHASE_DIFF_FIXED	1.839	2.317	2.958	0.023	0.026
16	61.13074598	-149.52047134	2637391.57	1663689.59	123.0		SG-13	POST-PROCESSED-DGPS	0.756	1.342	1.540	0.021	0.044
17	61.13075444	-149.52028763	2637400.34	1663779.53	122.0		SG-14	PHASE_DIFF_FIXED	1.300	1.783	2.206	0.085	0.041
18	61.13098996	-149.52074672	2637639.04	1663554.25	0.00		Church_NWX	Conventional Survey					
19	61.13096276	-149.52074709	2637611.42	1663554.13	0.00		Church_SWX_L	Conventional Survey					
20	61.13096272	-149.52071865	2637611.41	1663568.05	0.00		Church_AP	Conventional Survey					
21	61.13091911	-149.52073334	2637567.11	1663560.95	0.00		Church_NWX_Entry	Conventional Survey					
22	61.13091128	-149.52073348	2637559.16	1663560.89	0.00		Church_SWX_Entry	Conventional Survey					
23	61.13088886	-149.52071931	2637536.41	1663567.88	0.00		Church_SW	Conventional Survey					
24	61.13088865	-149.52064476	2637536.26	1663604.38	0.00		Church_SE	Conventional Survey					
25	61.13084192	-149.52045720	2637489.00	1663696.32	0.00		PIP_NW	Conventional Survey					
26	61.13084179	-149.52030211	2637489.02	1663772.26	0.00		PIP_NE	Conventional Survey					
27	61.13071446	-149.52045766	2637359.57	1663696.35	0.00		PIP_SW	Conventional Survey					
								<i>min</i>	0.754	1.305	1.540	0.004	0.007
								<i>max</i>	1.839	2.317	2.958	0.085	0.071

APPENDIX D

Borehole Logs

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Log of Exploratory Borehole/ Monitoring Well Details MW-8

Borehole ID: MW-8

Monitoring Well ID: MW-8

PROJECT NAME: ADEC - 4th & Gambell
 LOCATION: Anchorage AK
 PROJECT MANAGER: Lisa Nicholson
 LOGGED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1
 DATUM ELEVATION:

START TIME / END TIME: 0810/1245
 DATE COMPLETED: 4/27/11
 TOTAL BOREHOLE DEPTH: 48'
 DRILLING CONTRACTOR: GeoTek Alaska, Inc.
 DRILL RIG TYPE: Geoprobe
 SAMPLING METHOD: Macro-Core

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	SAMPLE ID (11-4AG-XXX-SO)	TIME SAMPLED	WELL DETAIL	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
5.0/4.5	0.0	ND	001	1000		21.0		
	0.0					22.0		Gravelly Sand 21.0-24.2 Gray-brown; moist; poorly sorted; 5% coarse gravel; 5% fine gravel; 85% fine sand; 5% fines Note: Black coal lens at 21.8-21.9 and Fines with coal (70% fines, 30% coal; non-plastic) at 21.9-22.0
	0.0					23.0		
	0.0					24.0		
5.0/5.0	0.0	ND				25.0		Sand 24.2-25.5 Well sorted fine to medium sand
	0.0					26.0		
	0.0					27.0		Gravelly Sand 25.5-29.4 Gray-brown; moist; moderately sorted; 5% fine gravel; 90% fine to medium sand; 5% fines Note: At 26.6-27.0 the lithologic description is the same as 21.0-24.2
	0.0					28.0		
	0.0					29.0		28.0 Gray-brown; moist; poorly sorted; 25% coarse gravel; 10% fine gravel; 60% fine to coarse sand; 5% fines
5.0/4.8	0.0	ND				30.0		Sand and Gravel 29.4-32.2 Gray-brown; moist; well sorted; 5% fine gravel; 5% fines; 90% fine to coarse sand
	0.0					31.0		
	0.0					32.0		
	0.0					33.0		Sand 32.2-46.4 Gray-brown; moist; well sorted; 5% fines; 95% fine to coarse sand; NO GRAVEL
	0.0					34.0		33.6 95% fine sand with 5% fines Note: Moisture increases downward between ~35 and 41.3. Wet at 41.3
5.0/5.0	0.0	ND				35.0		
	0.0					36.0		35.2 95% fine to medium sand with 5% fines Note: Fine sand lens at 35.8-36.2
	0.0					37.0		
	0.0					38.0		
	0.0					39.0		
	0.0					40.0		

DATE: 5/24/11
 DRAWN BY: Mike Helms
 CHECKED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1

COMMENTS:



Log of Exploratory Borehole/ Monitoring Well Details MW-8

Borehole ID: MW-8

Monitoring Well ID: MW-8

PROJECT NAME: ADEC - 4th & Gambell
 LOCATION: Anchorage AK
 PROJECT MANAGER: Lisa Nicholson
 LOGGED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1
 DATUM ELEVATION:

START TIME / END TIME: 0810/1245
 DATE COMPLETED: 4/27/11
 TOTAL BOREHOLE DEPTH: 48'
 DRILLING CONTRACTOR: GeoTek Alaska, Inc.
 DRILL RIG TYPE: Geoprobe
 SAMPLING METHOD: Macro-Core

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	SAMPLE ID (11-4AG-XXX-SO)	TIME SAMPLED	WELL DETAIL	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
5.0/5.0	0.0	ND				41.0		
	0.0					42.0		
	0.0					43.0		
5.0/5.0	0.0					44.0		
	0.0					45.0		
	0.0					46.0		
	0.0	ND	002	1150		47.0		Sand with Fines 46.4-48.0 30% dense yellowish-gray clay; 65% fine to coarse sand; 5% coal
	0.0					48.0		47.0 60% fine to medium sand; contains 40% 1/8" thick yellowish-gray clay lenses
						49.0		
						50.0		
						51.0		
						52.0		
						53.0		
						54.0		
						55.0		
						56.0		
						57.0		
						58.0		
						59.0		
						60.0		

DATE: 5/24/11
 DRAWN BY: Mike Helms
 CHECKED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1

COMMENTS:



Log of Exploratory Borehole/ Monitoring Well Details MW-9

Borehole ID: MW-9

Monitoring Well ID: MW-9

PROJECT NAME: ADEC - 4th & Gambell
LOCATION: Anchorage AK
PROJECT MANAGER: Lisa Nicholson
LOGGED BY: Lisa Nicholson
PROJECT NUMBER: 14-200-02-1
DATUM ELEVATION:

START TIME / END TIME: 1430/1745
DATE COMPLETED: 4/26/11
TOTAL BOREHOLE DEPTH: 48'
DRILLING CONTRACTOR: GeoTek Alaska, Inc.
DRILL RIG TYPE: Geoprobe
SAMPLING METHOD: Macro-Core (3" Cores)

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	SAMPLE ID (11-4AG-XXX-SO)	TIME SAMPLED	WELL DETAIL	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
8.0/4.4	0.0					1.0		Sandy Gravel 0.0-3.8 Gray-brown; dry; poorly sorted; 50% coarse rounded gravel; 30% fine rounded gravel; 15% fine to coarse sand; 5% fines
	0.0					2.0		
	0.0					3.0		
	0.0	ND				4.0		Gravelly Sand 3.8-5.0 Gray-brown; damp; poorly sorted; 25% coarse gravel; 10% fine gravel; 10% coarse sand; 50% fine to medium sand; 5% fines Note: 1" thick layer of reddish brown fines at 4.5'
	0.0					5.0		Sandy Gravel 5.0-9.0 Gray-brown; dry; poorly sorted; 50% coarse rounded gravel; 30% fine rounded gravel; 15% fine to coarse sand; 5% fines
	0.0					6.0		
	0.0					7.0		
	0.0					8.0		
5.0/4.7	0.0					9.0		Gravelly Sand 9.0-13.0 Gray-brown; moist; poorly sorted; 25% Coarse gravel; 20% fine gravel; 50% fine to coarse sand; 5% fines Note: 1" thick black charcoal layer at 12.8'
	0.0	ND				10.0		
	0.0					11.0		
	0.0					12.0		
	0.0					13.0		Gravelly Sand 13.0-15.0 Gray-brown; moist; moderately sorted; 15% coarse gravel; 5% fine gravel; 75% fine to medium sand; 5% fines Note: 1" thick black charcoal layer at 13.5'
	0.0					14.0		
	0.0					15.0		Sand 15.0-17.4 Moist; well sorted; fine to medium sand; <5% fines Note: Black charcoal lens at 15.7; 17.2. Gravelly sand layer at 15.9-16.1
	0.0	ND				16.0		
5.0/4.5	0.0					17.0		Sandy Gravel 17.4-18.0 Gray-brown; damp; 10% coarse gravel; 60% fine gravel; 25% fine to coarse sand
	0.0					18.0		Sand and Gravel 18.0-20.0 Gray-brown; moist; moderately sorted; fine to medium sand with 10% fine to coarse gravel Note: Black charcoal layer at 18.7-18.9
	0.0					19.0		
	0.0					20.0		
	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.7	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							
	0.0							
5.0/4.5	0.0							
	0.0							
	0.0							

Log of Exploratory Borehole/ Monitoring Well Details MW-9

Borehole ID: MW-9

Monitoring Well ID: MW-9

PROJECT NAME: ADEC - 4th & Gambell
 LOCATION: Anchorage AK
 PROJECT MANAGER: Lisa Nicholson
 LOGGED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1
 DATUM ELEVATION:

START TIME / END TIME: 1430/1745
 DATE COMPLETED: 4/26/11
 TOTAL BOREHOLE DEPTH: 48'
 DRILLING CONTRACTOR: GeoTek Alaska, Inc.
 DRILL RIG TYPE: Geoprobe
 SAMPLING METHOD: Macro-Core (3" Cores)

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	SAMPLE ID (11-4AG-XXX-SO)	TIME SAMPLED	WELL DETAIL	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
5.0/4.6	0.0					21.0		Sandy Gravel 20.0-20.5 Gray-brown; damp; 10% coarse gravel; 60% fine gravel; 25% fine to coarse sand
	0.0					22.0		Gravelly Sand 20.5-28.5 Gray-brown; moist; moderately sorted; 15% coarse gravel; 5% fine gravel; Note: Sand lenses at 24.7-25.1; 27.7-28.5
	0.0					23.0		
	0.0					24.0		
5.0/4.7	0.0	ND				25.0		
	0.0					26.0		
	0.0					27.0		
	0.0					28.0		
	0.0					29.0		Sand and Fine Gravel 28.5-29.4 Moist; moderately-well sorted; fine to medium sand with 5-10% fine gravel
5.0/4.4	0.0					30.0		Fine Sand 29.4-29.8 Moist; Well sorted
	0.0					31.0		Sand 29.8-32.6 Gray-brown; moist; fine to medium sand Note: Gravelly sand layer at 30.6-31.5
	0.0	ND				32.0		
	0.0					33.0		Sand 32.6-33.0 Fine well sorted sand
	0.0					34.0		Sand 33.0-37.5 Moist; fine to medium well sorted sand
5.0/4.2	0.0					35.0		
	0.0	ND				36.0		Slightly increasing moisture content
	0.0					37.0		
	0.0					38.0		Fine Sand 37.5-38.8 Moist; well sorted
	0.0					39.0		Sand 38.8-43.9 Moist; fine to medium well sorted sand
	0.0					40.0		

DATE: 5/24/11
 DRAWN BY: Mike Helms
 CHECKED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1

COMMENTS:



Log of Exploratory Borehole/ Monitoring Well Details MW-9

Borehole ID: MW-9

Monitoring Well ID: MW-9

PROJECT NAME: ADEC - 4th & Gambell
 LOCATION: Anchorage AK
 PROJECT MANAGER: Lisa Nicholson
 LOGGED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1
 DATUM ELEVATION:

START TIME / END TIME: 1430/1745
 DATE COMPLETED: 4/26/11
 TOTAL BOREHOLE DEPTH: 48'
 DRILLING CONTRACTOR: GeoTek Alaska, Inc.
 DRILL RIG TYPE: Geoprobe
 SAMPLING METHOD: Macro-Core (3" Cores)

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	SAMPLE ID (11-4AG-XXX-SO)	TIME SAMPLED	WELL DETAIL	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
4.5/4.8	0.0	ND	004	1745		41.0		
	0.0					42.0		
	0.0					43.0		
4.5/4.7	0.0	ND				44.0		Clay 43.9-44.2 Red-gray; extremely dense
	0.0					45.0		Sandy Silt 44.2-45.1 Gray-brown; saturated
	0.0					46.0		Sand 45.1-46.0 Gray-brown; saturated; fine to medium sand
	0.0					46.0		Clay 46.0-46.6 Red-gray; extremely dense
	0.0					47.0		Sand 46.6-47.0 Gray-brown; saturated; fine to medium sand
1.0/1.0	0.0					48.0		Clay 47.0-48.0 Red-gray; extremely dense
						49.0		
						50.0		
						51.0		
						52.0		
						53.0		
						54.0		
						55.0		
						56.0		
						57.0		
						58.0		
						59.0		
						60.0		

DATE: 5/24/11
 DRAWN BY: Mike Helms
 CHECKED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1

COMMENTS:



Log of Exploratory Borehole/ Monitoring Well Details MW-10

Borehole ID: MW-10

Monitoring Well ID: MW-10

PROJECT NAME: ADEC - 4th & Gambell
LOCATION: Anchorage AK
PROJECT MANAGER: Lisa Nicholson
LOGGED BY: Lisa Nicholson
PROJECT NUMBER: 14-200-02-1
DATUM ELEVATION:

START TIME / END TIME: 1430(4/25/11)/0930(4/26/11)
DATE COMPLETED: 4/26/11
TOTAL BOREHOLE DEPTH: 50
DRILLING CONTRACTOR: GeoTek Alaska, Inc.
DRILL RIG TYPE: Geoprobe
SAMPLING METHOD: Macro-Core

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	SAMPLE ID (11-4AG-XXX-SO)	TIME SAMPLED	WELL DETAIL	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
5.0/3.0	0.0					1.0		Sandy Gravel 0.0-12.0 Moist; Poorly sorted; 60% coarse rounded gravel; 20% fine rounded gravel; 20% fine to coarse sand
	0.0					2.0		
	0.0	ND				3.0		
	0.0					4.0		
	0.0					5.0		
5.0/4.3	0.0					6.0		7.0 30% coarse gravel; 20% fine gravel; 50% fine to coarse sand 8.0 Moist; Poorly sorted; 60% coarse rounded gravel; 20% fine rounded gravel; 20% fine to coarse sand
	0.0					7.0		
	0.0	ND				8.0		
	0.0					9.0		
	0.0					10.0		
5.0/4.7	0.0					11.0		Gravelly Sand 12.0-25.0 Moist; poorly sorted; 30% coarse rounded gravel; 10% fine rounded gravel; 65% fine to coarse sand; 5% fines Note: Black charcoal layers at 16.5; 17.5; 18.5. Sand lenses of fine to medium grained; moist; well sorted sand at 20.6-21.4; 23.0-23.5; 24.5-25.0
	0.0					12.0		
	0.0					13.0		
	0.0	ND				14.0		
	0.0					15.0		
5.0/4.0	0.0					16.0		
	0.0					17.0		
	0.0	ND	005	1600		18.0		
	0.0					19.0		
	0.0					20.0		

DATE: 5/26/11
DRAWN BY: Mike Helms
CHECKED BY: Lisa Nicholson
PROJECT NUMBER: 14-200-02-1

COMMENTS:



Log of Exploratory Borehole/ Monitoring Well Details MW-10

Borehole ID: MW-10

Monitoring Well ID: MW-10

PROJECT NAME: ADEC - 4th & Gambell
LOCATION: Anchorage AK
PROJECT MANAGER: Lisa Nicholson
LOGGED BY: Lisa Nicholson
PROJECT NUMBER: 14-200-02-1
DATUM ELEVATION:

START TIME / END TIME: 1430(4/25/11)/0930(4/26/11)
DATE COMPLETED: 4/26/11
TOTAL BOREHOLE DEPTH: 50
DRILLING CONTRACTOR: GeoTek Alaska, Inc.
DRILL RIG TYPE: Geoprobe
SAMPLING METHOD: Macro-Core

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	SAMPLE ID (11-4AG-XXX-SO)	TIME SAMPLED	WELL DETAIL	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
5.0/4.9	0.0	ND				21.0		
	0.0					22.0		
	0.0					23.0		
	0.0					24.0		
	0.0					25.0		
5.0/5.0	0.0					26.0		Dry-Damp; poorly sorted; loose; 25% coarse gravel; 10% fine gravel; 70% fine to coarse sand; 5% fines Note: Sand lenses of fine to medium sand at 25.7-26.5; 27.2-28.2; 28.9-30.8
	0.0	ND				27.0		
	0.0					28.0		
	0.0					29.0		
	0.0					30.0		
5.0/4.7	0.0					31.0		Sand and Gravel 30.8-31.9 Moist; moderately sorted; 5% fine rounded gravel; 20% coarse sand; 70% fine to medium sand; 5% fines
	0.0	ND				32.0		Sand 31.9-50.0 Moist; well sorted; 100% fine to mediumgrained sand
	0.0					33.0		
	0.0					34.0		
	0.0					35.0		Sand is moist to slightly wet from 35-40
5.0/4.4	0.0					36.0		
	0.0	ND	006	1725		37.0		
	0.0					38.0		
	0.0					39.0		
	0.0					40.0		

DATE: 5/26/11
DRAWN BY: Mike Helms
CHECKED BY: Lisa Nicholson
PROJECT NUMBER: 14-200-02-1

COMMENTS:



Log of Exploratory Borehole/ Monitoring Well Details MW-10

Borehole ID: MW-10

Monitoring Well ID: MW-10

PROJECT NAME: ADEC - 4th & Gambell
 LOCATION: Anchorage AK
 PROJECT MANAGER: Lisa Nicholson
 LOGGED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1
 DATUM ELEVATION:

START TIME / END TIME: 1430(4/25/11)/0930(4/26/11)
 DATE COMPLETED: 4/26/11
 TOTAL BOREHOLE DEPTH: 50
 DRILLING CONTRACTOR: GeoTek Alaska, Inc.
 DRILL RIG TYPE: Geoprobe
 SAMPLING METHOD: Macro-Core

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	SAMPLE ID (11-4AG-XXX-SO)	TIME SAMPLED	WELL DETAIL	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
Sleeve destroyed during extraction. Soil caught in plastic ziploc bags	0.0	ND				41.0		From 40-45 the core sleeve was stuck in core barrel-the drillers had to dump soil from end of sleeve. Separated soil as best at possible into 1' increments in plastic ziploc bags. The soil was then tagged and sampled from the bags. Sand is wet at 40-45
						42.0		
						43.0		
4.0/5.0	0.0	ND				44.0		Sand is wet-saturated From 46.2-48.0 lenses of brownish-red (brick colored) clay comprise ~60% of core
						45.0		
						46.0		
1.0/4.0	0.0					47.0		Heaving Sands-the borehole caved in with sand from 48-50.
						48.0		
						49.0		
	0.0					50.0		
						51.0		
						52.0		
						53.0		
						54.0		
						55.0		
						56.0		
						57.0		
						58.0		
						59.0		
						60.0		

DATE: 5/26/11
 DRAWN BY: Mike Helms
 CHECKED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1

COMMENTS:



Log of Exploratory Borehole/ Monitoring Well Details MW-11

Borehole ID: MW-11

Monitoring Well ID: MW-11

PROJECT NAME: ADEC - 4th & Gambell
 LOCATION: Anchorage AK
 PROJECT MANAGER: Lisa Nicholson
 LOGGED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1
 DATUM ELEVATION:

START TIME / END TIME: 1010/1345
 DATE COMPLETED: 4/26/11
 TOTAL BOREHOLE DEPTH: 48'
 DRILLING CONTRACTOR: GeoTek Alaska, Inc.
 DRILL RIG TYPE: Geoprobe
 SAMPLING METHOD: Macro-Core (3" cores)

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	SAMPLE ID (11-4AG-XXX-SO)	TIME SAMPLED	WELL DETAIL	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
3.0/2.5	0.0	ND				1.0		Sandy Gravel 0.0-13.0 30% coarse rounded gravel; 15% fine to coarse rounded gravel; 45% sand; 5% fines Note: Fine to medium sand lenses at 3.0-4.0; 6.8-7.1; 8.0-8.5; 10.3-11.4
	0.0					2.0		
	0.0					3.0		
5.0/4.3	0.0					4.0		
	0.0	ND				5.0		
	0.0					6.0		
	0.0					7.0		
	0.0					8.0		
	0.0					9.0		
5.0/4.8	0.0					10.0		
	0.0	ND				11.0		
	0.0					12.0		
	0.0					13.0		Gravelly Sand 13.0-19.0 40% coarse rounded gravel; 30% fine rounded gravel; 25% sand; 5% fines Note: Black charcoal lens at 15.8-16.0; Clay lens at 16.1-16.2
5.0/4.6	0.0	ND				14.0		
	0.0					15.0		
	0.0					16.0		
	0.0					17.0		
	0.0					18.0		
	0.0					19.0		
	0.0					20.0		

DATE: 5/27/11
 DRAWN BY: Mike Helms
 CHECKED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1

COMMENTS:



Log of Exploratory Borehole/ Monitoring Well Details MW-11

Borehole ID: MW-11

Monitoring Well ID: MW-11

PROJECT NAME: ADEC - 4th & Gambell
 LOCATION: Anchorage AK
 PROJECT MANAGER: Lisa Nicholson
 LOGGED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1
 DATUM ELEVATION:

START TIME / END TIME: 1010/1345
 DATE COMPLETED: 4/26/11
 TOTAL BOREHOLE DEPTH: 48'
 DRILLING CONTRACTOR: GeoTek Alaska, Inc.
 DRILL RIG TYPE: Geoprobe
 SAMPLING METHOD: Macro-Core (3" cores)

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	SAMPLE ID (11-4AG-XXX-SO)	TIME SAMPLED	WELL DETAIL	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
5.0/4.7	0.0	ND	007	1140		21.0		Gravelly Sand 19.0-25.9 25% coarse rounded gravel; 10% fine rounded gravel; 30% coarse sand; 30% fine to medium sand; 5% fines Note: Sand lenses at 18.1-18.4; 18.5-18.9; 23.0-23.5; 24.0-25.0
	0.0					22.0		
	0.0					23.0		
5.0/4.7	0.0	ND				24.0		Sand and Gravel 25.9-33.0 Moist; well sorted; fine to medium sand with up to 5% fine to coarse gravel
	0.0					25.0		
	0.0					26.0		
	0.0					27.0		
	0.0					28.0		
	0.0					29.0		
Core sleeve destroyed during extraction. Soil caught in plastic ziploc bags	0.0	ND				30.0		Sand 33.0-48.0 Gray-brown; moist; well sorted; fine to medium sand; no gravel Note: Yellowish red (mottled) at 43.5-43.7; Clay and sand (50/50 mix) from 44.0-45.0
	0.0					31.0		
	0.0					32.0		
	0.0					33.0		
	0.0					34.0		
	0.0					35.0		
4.5/4.5	0.0	ND				36.0		
	0.0					37.0		
	0.0					38.0		
	0.0					39.0		
4.5/4.8	0.0					40.0		

DATE: 5/27/11
 DRAWN BY: Mike Helms
 CHECKED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1

COMMENTS:



Log of Exploratory Borehole/ Monitoring Well Details MW-11

Borehole ID: MW-11

Monitoring Well ID: MW-11

PROJECT NAME: ADEC - 4th & Gambell
 LOCATION: Anchorage AK
 PROJECT MANAGER: Lisa Nicholson
 LOGGED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1
 DATUM ELEVATION:

START TIME / END TIME: 1010/1345
 DATE COMPLETED: 4/26/11
 TOTAL BOREHOLE DEPTH: 48'
 DRILLING CONTRACTOR: GeoTek Alaska, Inc.
 DRILL RIG TYPE: Geoprobe
 SAMPLING METHOD: Macro-Core (3" cores)

DRIVEN/ RECOVERED (feet)	PID (ppm)	Color-Tec (ppm)	SAMPLE ID (11-4AG-XXX-SO)	TIME SAMPLED	WELL DETAIL	DEPTH (ft)	LITHOLOGIC COLUMN	LITHOLOGIC DESCRIPTION
	0.0	ND	008	1310		41.0		
	0.0					42.0		41.8 Sand becomes wet
5.0/5.0	0.0					43.0		
	0.0					44.0		
	0.0	ND				45.0		
	0.0					46.0		
1.0/2.0	0.0					47.0		
	0.0					48.0		
						49.0		
						50.0		
						51.0		
						52.0		
						53.0		
						54.0		
						55.0		
						56.0		
						57.0		
						58.0		
						59.0		
						60.0		

DATE: 5/27/11
 DRAWN BY: Mike Helms
 CHECKED BY: Lisa Nicholson
 PROJECT NUMBER: 14-200-02-1

COMMENTS:



APPENDIX E

Laboratory Analytical Reports and ADEC Data Review Checklists

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14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

May 4, 2011

Lisa Nicholson
Oasis Environmental, Inc.
825 W 8th Avenue, Suite 200
Anchorage, AK 99501

Re: Analytical Data for Project 14-200-02-1
Laboratory Reference No. 1104-214

Dear Lisa:

Enclosed are the analytical results and associated quality control data for samples submitted on April 29, 2011.

CS Laboratory Approval Number: UST-039

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read 'DB', with a long horizontal line extending to the right.

David Baumeister
Project Manager

Enclosures

Date of Report: May 4, 2011
Samples Submitted: April 29, 2011
Laboratory Reference: 1104-214
Project: 14-200-02-1

Case Narrative

Samples were collected on April 25, 26, and 27, 2011 and received by the laboratory on April 29, 2011. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: May 4, 2011
Samples Submitted: April 29, 2011
Laboratory Reference: 1104-214
Project: 14-200-02-1

Analyst's Signature


Stacey Duran, Volatiles Chemist

5-4-11
Date

Date of Report: May 4, 2011
 Samples Submitted: April 29, 2011
 Laboratory Reference: 1104-214
 Project: 14-200-02-1

HALOGENATED VOLATILES by EPA 8260B

Matrix: Soil
 Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: 11-4AG-001-SO						
Laboratory ID: 04-214-01						
Vinyl Chloride	ND	0.026	EPA 8260	5-2-11	5-2-11	
1,1-Dichloroethene	ND	0.026	EPA 8260	5-2-11	5-2-11	
(trans) 1,2-Dichloroethene	ND	0.026	EPA 8260	5-2-11	5-2-11	
(cis) 1,2-Dichloroethene	ND	0.026	EPA 8260	5-2-11	5-2-11	
Trichloroethene	ND	0.026	EPA 8260	5-2-11	5-2-11	
Tetrachloroethene	ND	0.026	EPA 8260	5-2-11	5-2-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>73</i>	<i>63-127</i>				
<i>Toluene-d8</i>	<i>80</i>	<i>65-129</i>				
<i>4-Bromofluorobenzene</i>	<i>82</i>	<i>55-121</i>				

Date of Report: May 4, 2011
 Samples Submitted: April 29, 2011
 Laboratory Reference: 1104-214
 Project: 14-200-02-1

HALOGENATED VOLATILES by EPA 8260B

Matrix: Soil
 Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: 11-4AG-002-SO						
Laboratory ID: 04-214-02						
Vinyl Chloride	ND	0.038	EPA 8260	5-2-11	5-2-11	
1,1-Dichloroethene	ND	0.038	EPA 8260	5-2-11	5-2-11	
(trans) 1,2-Dichloroethene	ND	0.038	EPA 8260	5-2-11	5-2-11	
(cis) 1,2-Dichloroethene	ND	0.038	EPA 8260	5-2-11	5-2-11	
Trichloroethene	ND	0.038	EPA 8260	5-2-11	5-2-11	
Tetrachloroethene	ND	0.038	EPA 8260	5-2-11	5-2-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>71</i>	<i>63-127</i>				
<i>Toluene-d8</i>	<i>84</i>	<i>65-129</i>				
<i>4-Bromofluorobenzene</i>	<i>83</i>	<i>55-121</i>				

Date of Report: May 4, 2011
 Samples Submitted: April 29, 2011
 Laboratory Reference: 1104-214
 Project: 14-200-02-1

HALOGENATED VOLATILES by EPA 8260B

Matrix: Soil
 Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: 11-4AG-003-SO						
Laboratory ID: 04-214-03						
Vinyl Chloride	ND	0.034	EPA 8260	5-2-11	5-2-11	
1,1-Dichloroethene	ND	0.034	EPA 8260	5-2-11	5-2-11	
(trans) 1,2-Dichloroethene	ND	0.034	EPA 8260	5-2-11	5-2-11	
(cis) 1,2-Dichloroethene	ND	0.034	EPA 8260	5-2-11	5-2-11	
Trichloroethene	ND	0.034	EPA 8260	5-2-11	5-2-11	
Tetrachloroethene	ND	0.034	EPA 8260	5-2-11	5-2-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>72</i>	<i>63-127</i>				
<i>Toluene-d8</i>	<i>82</i>	<i>65-129</i>				
<i>4-Bromofluorobenzene</i>	<i>83</i>	<i>55-121</i>				

Date of Report: May 4, 2011
 Samples Submitted: April 29, 2011
 Laboratory Reference: 1104-214
 Project: 14-200-02-1

HALOGENATED VOLATILES by EPA 8260B

Matrix: Soil
 Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: 11-4AG-004-SO						
Laboratory ID: 04-214-04						
Vinyl Chloride	ND	0.040	EPA 8260	5-2-11	5-2-11	
1,1-Dichloroethene	ND	0.040	EPA 8260	5-2-11	5-2-11	
(trans) 1,2-Dichloroethene	ND	0.040	EPA 8260	5-2-11	5-2-11	
(cis) 1,2-Dichloroethene	ND	0.040	EPA 8260	5-2-11	5-2-11	
Trichloroethene	ND	0.040	EPA 8260	5-2-11	5-2-11	
Tetrachloroethene	ND	0.040	EPA 8260	5-2-11	5-2-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>72</i>	<i>63-127</i>				
<i>Toluene-d8</i>	<i>85</i>	<i>65-129</i>				
<i>4-Bromofluorobenzene</i>	<i>85</i>	<i>55-121</i>				

Date of Report: May 4, 2011
 Samples Submitted: April 29, 2011
 Laboratory Reference: 1104-214
 Project: 14-200-02-1

HALOGENATED VOLATILES by EPA 8260B

Matrix: Soil
 Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: 11-4AG-005-SO						
Laboratory ID: 04-214-05						
Vinyl Chloride	ND	0.033	EPA 8260	5-2-11	5-2-11	
1,1-Dichloroethene	ND	0.033	EPA 8260	5-2-11	5-2-11	
(trans) 1,2-Dichloroethene	ND	0.033	EPA 8260	5-2-11	5-2-11	
(cis) 1,2-Dichloroethene	ND	0.033	EPA 8260	5-2-11	5-2-11	
Trichloroethene	ND	0.033	EPA 8260	5-2-11	5-2-11	
Tetrachloroethene	ND	0.033	EPA 8260	5-2-11	5-2-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>72</i>	<i>63-127</i>				
<i>Toluene-d8</i>	<i>85</i>	<i>65-129</i>				
<i>4-Bromofluorobenzene</i>	<i>84</i>	<i>55-121</i>				

Date of Report: May 4, 2011
 Samples Submitted: April 29, 2011
 Laboratory Reference: 1104-214
 Project: 14-200-02-1

HALOGENATED VOLATILES by EPA 8260B

Matrix: Soil
 Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: 11-4AG-006-SO						
Laboratory ID: 04-214-06						
Vinyl Chloride	ND	0.036	EPA 8260	5-2-11	5-2-11	
1,1-Dichloroethene	ND	0.036	EPA 8260	5-2-11	5-2-11	
(trans) 1,2-Dichloroethene	ND	0.036	EPA 8260	5-2-11	5-2-11	
(cis) 1,2-Dichloroethene	ND	0.036	EPA 8260	5-2-11	5-2-11	
Trichloroethene	ND	0.036	EPA 8260	5-2-11	5-2-11	
Tetrachloroethene	ND	0.036	EPA 8260	5-2-11	5-2-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>72</i>	<i>63-127</i>				
<i>Toluene-d8</i>	<i>84</i>	<i>65-129</i>				
<i>4-Bromofluorobenzene</i>	<i>82</i>	<i>55-121</i>				

Date of Report: May 4, 2011
 Samples Submitted: April 29, 2011
 Laboratory Reference: 1104-214
 Project: 14-200-02-1

HALOGENATED VOLATILES by EPA 8260B

Matrix: Soil
 Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: 11-4AG-007-SO						
Laboratory ID: 04-214-07						
Vinyl Chloride	ND	0.025	EPA 8260	5-2-11	5-2-11	
1,1-Dichloroethene	ND	0.025	EPA 8260	5-2-11	5-2-11	
(trans) 1,2-Dichloroethene	ND	0.025	EPA 8260	5-2-11	5-2-11	
(cis) 1,2-Dichloroethene	ND	0.025	EPA 8260	5-2-11	5-2-11	
Trichloroethene	ND	0.025	EPA 8260	5-2-11	5-2-11	
Tetrachloroethene	ND	0.025	EPA 8260	5-2-11	5-2-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>69</i>	<i>63-127</i>				
<i>Toluene-d8</i>	<i>84</i>	<i>65-129</i>				
<i>4-Bromofluorobenzene</i>	<i>85</i>	<i>55-121</i>				

Date of Report: May 4, 2011
 Samples Submitted: April 29, 2011
 Laboratory Reference: 1104-214
 Project: 14-200-02-1

HALOGENATED VOLATILES by EPA 8260B

Matrix: Soil
 Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: 11-4AG-008-SO						
Laboratory ID: 04-214-08						
Vinyl Chloride	ND	0.034	EPA 8260	5-2-11	5-2-11	
1,1-Dichloroethene	ND	0.034	EPA 8260	5-2-11	5-2-11	
(trans) 1,2-Dichloroethene	ND	0.034	EPA 8260	5-2-11	5-2-11	
(cis) 1,2-Dichloroethene	ND	0.034	EPA 8260	5-2-11	5-2-11	
Trichloroethene	ND	0.034	EPA 8260	5-2-11	5-2-11	
Tetrachloroethene	ND	0.034	EPA 8260	5-2-11	5-2-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>71</i>	<i>63-127</i>				
<i>Toluene-d8</i>	<i>85</i>	<i>65-129</i>				
<i>4-Bromofluorobenzene</i>	<i>93</i>	<i>55-121</i>				

Date of Report: May 4, 2011
 Samples Submitted: April 29, 2011
 Laboratory Reference: 1104-214
 Project: 14-200-02-1

HALOGENATED VOLATILES by EPA 8260B

Matrix: Soil
 Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: 11-4AG-009-SO						
Laboratory ID: 04-214-09						
Vinyl Chloride	ND	0.037	EPA 8260	5-2-11	5-2-11	
1,1-Dichloroethene	ND	0.037	EPA 8260	5-2-11	5-2-11	
(trans) 1,2-Dichloroethene	ND	0.037	EPA 8260	5-2-11	5-2-11	
(cis) 1,2-Dichloroethene	ND	0.037	EPA 8260	5-2-11	5-2-11	
Trichloroethene	ND	0.037	EPA 8260	5-2-11	5-2-11	
Tetrachloroethene	ND	0.037	EPA 8260	5-2-11	5-2-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>70</i>	<i>63-127</i>				
<i>Toluene-d8</i>	<i>86</i>	<i>65-129</i>				
<i>4-Bromofluorobenzene</i>	<i>86</i>	<i>55-121</i>				

Date of Report: May 4, 2011
 Samples Submitted: April 29, 2011
 Laboratory Reference: 1104-214
 Project: 14-200-02-1

HALOGENATED VOLATILES by EPA 8260B

Matrix: Soil
 Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: 11-4AG-010-SO						
Laboratory ID: 04-214-10						
Vinyl Chloride	ND	0.050	EPA 8260	5-2-11	5-2-11	
1,1-Dichloroethene	ND	0.050	EPA 8260	5-2-11	5-2-11	
(trans) 1,2-Dichloroethene	ND	0.050	EPA 8260	5-2-11	5-2-11	
(cis) 1,2-Dichloroethene	ND	0.050	EPA 8260	5-2-11	5-2-11	
Trichloroethene	ND	0.050	EPA 8260	5-2-11	5-2-11	
Tetrachloroethene	ND	0.050	EPA 8260	5-2-11	5-2-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>70</i>	<i>63-127</i>				
<i>Toluene-d8</i>	<i>84</i>	<i>65-129</i>				
<i>4-Bromofluorobenzene</i>	<i>82</i>	<i>55-121</i>				

Date of Report: May 4, 2011
 Samples Submitted: April 29, 2011
 Laboratory Reference: 1104-214
 Project: 14-200-02-1

**HALOGENATED VOLATILES by EPA 8260B
 METHOD BLANK QUALITY CONTROL**

Matrix: Soil
 Units: mg/kg

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
<hr/>						
Laboratory ID:	MB0502S2					
Vinyl Chloride	ND	0.050	EPA 8260	5-2-11	5-2-11	
1,1-Dichloroethene	ND	0.050	EPA 8260	5-2-11	5-2-11	
(trans) 1,2-Dichloroethene	ND	0.050	EPA 8260	5-2-11	5-2-11	
(cis) 1,2-Dichloroethene	ND	0.050	EPA 8260	5-2-11	5-2-11	
Trichloroethene	ND	0.050	EPA 8260	5-2-11	5-2-11	
Tetrachloroethene	ND	0.050	EPA 8260	5-2-11	5-2-11	
<hr/>						
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>71</i>	<i>63-127</i>				
<i>Toluene-d8</i>	<i>82</i>	<i>65-129</i>				
<i>4-Bromofluorobenzene</i>	<i>81</i>	<i>55-121</i>				

Date of Report: May 4, 2011
 Samples Submitted: April 29, 2011
 Laboratory Reference: 1104-214
 Project: 14-200-02-1

HALOGENATED VOLATILES by EPA 8260B
MS/MSD QUALITY CONTROL

Matrix: Soil
 Units: mg/kg

					Source	Percent	Recovery		RPD	
Analyte	Result		Spike Level		Result	Recovery	Limits	RPD	Limit	Flags
MATRIX SPIKES										
Laboratory ID:	04-214-02									
	MS	MSD	MS	MSD		MS	MSD			
1,1-Dichloroethene	1.44	1.43	1.33	1.33	ND	108	108	70-130	1	19
Benzene	1.39	1.39	1.33	1.33	ND	105	105	70-130	0	21
Trichloroethene	1.53	1.53	1.33	1.33	ND	115	115	70-122	0	21
Toluene	1.54	1.51	1.33	1.33	ND	116	114	70-126	2	20
Chlorobenzene	1.40	1.38	1.33	1.33	ND	105	104	70-113	1	18
Surrogate:										
Dibromofluoromethane						73	71	63-127		
Toluene-d8						84	83	65-129		
4-Bromofluorobenzene						84	82	55-121		

Date of Report: May 4, 2011
Samples Submitted: April 29, 2011
Laboratory Reference: 1104-214
Project: 14-200-02-1

% MOISTURE

Date Analyzed: 5-2-11

Client ID	Lab ID	% Moisture
11-4AG-001-SO	04-214-01	7
11-4AG-002-SO	04-214-02	15
11-4AG-003-SO	04-214-03	5
11-4AG-004-SO	04-214-04	4
11-4AG-005-SO	04-214-05	7
11-4AG-006-SO	04-214-06	2
11-4AG-007-SO	04-214-07	5
11-4AG-008-SO	04-214-08	10
11-4AG-009-SO	04-214-09	15



Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL

PQL - Practical Quantitation Limit

RPD - Relative Percent Difference



OnSite
Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Chain of Custody

Page 1 of 1

04-214

Company: OASIS Environmental, Inc.		Turnaround Request (in working days)		Laboratory Number: 04-214															
Project Number: 14-200-02-1		(Check One)																	
Project Name: 4th Gambell Site Characteriz.		<input type="checkbox"/> Same Day <input type="checkbox"/> 1 Day																	
Project Manager: Lisa Nicholson		<input type="checkbox"/> 2 Days <input type="checkbox"/> 3 Days																	
Sampled by: Lisa Nicholson		<input checked="" type="checkbox"/> Standard (7 Days) (TPH analysis 5 Days)																	
		<input type="checkbox"/> (other)																	
Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers														
1	11-4AG-001-SO	4/27/11	1000	Soil	NWTPH-HCID														
2	11-4AG-002-SO	4/27/11	1150	Soil	NWTPH-Gx/BTEX														
3	11-4AG-003-SO	4/26/11	1630	Soil	NWTPH-Gx														
4	11-4AG-004-SO	4/26/11	1745	Soil	NWTPH-Dx														
5	11-4AG-005-SO	4/25/11	1600	Soil	Volatiles 8260B														
6	11-4AG-006-SO	4/25/11	1725	Soil	Halogenated Volatiles 8260B														
7	11-4AG-007-SO	4/26/11	1140	Soil	Semivolatiles 8270D/SIM (with low-level PAHs)														
8	11-4AG-008-SO	4/26/11	1340	Soil	PAHs 8270D/SIM (low-level)														
9	11-4AG-009-SO	4/27/11	1200	Soil	PCBs 8082														
10	11-4AG-010-SO	4/25/11	1500	MeOH	Organochlorine Pesticides 8081A														
					Organophosphorus Pesticides 8270D/SIM														
					Chlorinated Acid Herbicides 8151A														
					Total RCRA / MTCA Metals (circle one)														
					TCLP Metals														
					HEM (oil and grease) 1664														
					%														
					Moisture														
Signature: Lisa Stiles		Company: OASIS Environmental		Date: 4/28/11		Time: 1330		Comments/Special Instructions: Non-preserved jars for moisture content											
Relinquished		Relinquished		Relinquished		Relinquished		Report only: PCE, TCE, cis-1,2-DE, trans-1,2-DE, and vinyl chloride											
Received		Received		Received		Received		Extra cooler contains MeOH - preserved samples not for analysis											
Reviewed/Date		Reviewed/Date		Reviewed/Date		Reviewed/Date		Chromatograms with final report											



14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

May 9, 2011

Lisa Nicholson
Oasis Environmental, Inc.
825 W 8th Avenue, Suite 200
Anchorage, AK 99501

Re: Analytical Data for Project 14-200-02-1
Laboratory Reference No. 1105-045

Dear Lisa:

Enclosed are the analytical results and associated quality control data for samples submitted on May 5, 2011.

CS Laboratory Approval Number: UST-039

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

A handwritten signature in black ink, appearing to read 'DB', with a long horizontal flourish extending to the right.

David Baumeister
Project Manager

Enclosures

Date of Report: May 9, 2011
Samples Submitted: May 5, 2011
Laboratory Reference: 1105-045
Project: 14-200-02-1

Case Narrative

Samples were collected on April 29, May 2 and 3, 2011 and received by the laboratory on May 5, 2011. They were maintained at the laboratory at a temperature of 2°C to 6°C except as noted below.


General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Volatiles EPA 8260B Analysis

The samples were received in pre-weighed 4 ounce jars preserved with 25 milliliters of Methanol.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Analyst's Signature



Stacey Duran, Volatiles Chemist



Date

Date of Report: May 9, 2011
 Samples Submitted: May 5, 2011
 Laboratory Reference: 1105-045
 Project: 14-200-02-1

VOLATILES by EPA 8260B

Matrix: Water
 Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: 11-4AG-011-GW						
Laboratory ID: 05-045-01						
Vinyl Chloride	ND	0.20	EPA 8260	5-6-11	5-6-11	
1,1-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Trichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Tetrachloroethene	0.24	0.20	EPA 8260	5-6-11	5-6-11	

<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>
<i>Dibromofluoromethane</i>	82	68-107
<i>Toluene-d8</i>	85	73-102
<i>4-Bromofluorobenzene</i>	80	65-104

Client ID: 11-4AG-012-GW

Laboratory ID: 05-045-02						
Vinyl Chloride	ND	0.20	EPA 8260	5-6-11	5-6-11	
1,1-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Trichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Tetrachloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	

<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>
<i>Dibromofluoromethane</i>	85	68-107
<i>Toluene-d8</i>	83	73-102
<i>4-Bromofluorobenzene</i>	81	65-104

Client ID: 11-4AG-013-GW

Laboratory ID: 05-045-03						
Vinyl Chloride	ND	0.20	EPA 8260	5-6-11	5-6-11	
1,1-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Trichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Tetrachloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	

<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>
<i>Dibromofluoromethane</i>	84	68-107
<i>Toluene-d8</i>	85	73-102
<i>4-Bromofluorobenzene</i>	83	65-104

Date of Report: May 9, 2011
 Samples Submitted: May 5, 2011
 Laboratory Reference: 1105-045
 Project: 14-200-02-1

VOLATILES by EPA 8260B

Matrix: Water
 Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID: 11-4AG-014-GW						
Laboratory ID: 05-045-04						
Vinyl Chloride	ND	0.20	EPA 8260	5-6-11	5-6-11	
1,1-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Trichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Tetrachloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>88</i>	<i>68-107</i>				
<i>Toluene-d8</i>	<i>83</i>	<i>73-102</i>				
<i>4-Bromofluorobenzene</i>	<i>81</i>	<i>65-104</i>				

Client ID: 11-4AG-015-GW						
Laboratory ID: 05-045-05						
Vinyl Chloride	ND	0.20	EPA 8260	5-6-11	5-6-11	
1,1-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Trichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Tetrachloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>83</i>	<i>68-107</i>				
<i>Toluene-d8</i>	<i>84</i>	<i>73-102</i>				
<i>4-Bromofluorobenzene</i>	<i>78</i>	<i>65-104</i>				

Client ID: 11-4AG-TB-04						
Laboratory ID: 05-045-06						
Vinyl Chloride	ND	0.20	EPA 8260	5-6-11	5-6-11	
1,1-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Trichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Tetrachloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	<i>91</i>	<i>68-107</i>				
<i>Toluene-d8</i>	<i>91</i>	<i>73-102</i>				
<i>4-Bromofluorobenzene</i>	<i>88</i>	<i>65-104</i>				

Date of Report: May 9, 2011
 Samples Submitted: May 5, 2011
 Laboratory Reference: 1105-045
 Project: 14-200-02-1

VOLATILES by EPA 8260B
QUALITY CONTROL

Matrix: Water

Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0506W1					
Vinyl Chloride	ND	0.20	EPA 8260	5-6-11	5-6-11	
1,1-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(trans) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
(cis) 1,2-Dichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Trichloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
Tetrachloroethene	ND	0.20	EPA 8260	5-6-11	5-6-11	
<i>Surrogate:</i>	<i>Percent Recovery</i>	<i>Control Limits</i>				
<i>Dibromofluoromethane</i>	83	68-107				
<i>Toluene-d8</i>	85	73-102				
<i>4-Bromofluorobenzene</i>	78	65-104				

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES										
Laboratory ID:	05-045-04									
	MS	MSD	MS	MSD		MS	MSD			
1,1-Dichloroethene	10.5	10.2	10.0	10.0	ND	105	102	70-130	3	12
Benzene	9.93	10.1	10.0	10.0	ND	99	101	84-123	2	11
Trichloroethene	9.68	9.90	10.0	10.0	ND	97	99	80-117	2	14
Toluene	10.1	10.3	10.0	10.0	ND	101	103	87-115	2	12
Chlorobenzene	10.1	10.4	10.0	10.0	ND	101	104	86-117	3	13
Surrogate:										
Dibromofluoromethane						84	81	68-107		
Toluene-d8						83	84	73-102		
4-Bromofluorobenzene						79	80	65-104		



Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL

PQL - Practical Quantitation Limit

RPD - Relative Percent Difference



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Page 24

05-045

Environmental Inc.

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05-045

Company:

OASIS Environmental

Project Number:

14-200-02-1

Project Name:

4th & Gambel Site Investigation

Project Manager:

Lisa Nicholson

Sampled by:

Lisa Nicholson

Turnaround Request
(in working days)

(Check One)

☐ Same Day

☐ 1 Day

☐ 2 Days

☒ 3 Days

☒ Standard (7 Days)
(TPH analysis 5 Days)

☐ _____
(other)

Laboratory Number:

Number of Containers

NWT PH-HCID

NWT PH-Gx/BTEX

NWT PH-Gx

NWT PH-Dx

Volatiles 8260B *

Halogenated Volatiles 8260B

Semivolatiles 8270D/SIM
(with low-level PAHs)

PAHs 8270D/SIM (low-level)

PCBs 8082

Organochlorine Pesticides 8081A

Organophosphorus Pesticides 8270D/SIM

Chlorinated Acid Herbicides 8151A

Total RCRA / MTCA Metals (circle one)

TCLP Metals

HEM (oil and grease) 1664

% Moisture

Lab ID Sample Identification

Date Sampled	Time Sampled	Matrix
--------------	--------------	--------

1 11-4AG-OI1-GW

4/29/11 1210 W

3

2 11-4AG-OI2-GW

5/2/11 1640 W

3

3 11-4AG-OI3-GW

5/3/11 1010 W

3

4 11-4AG-OI4-GW

5/2/11 1945 W

9

5 11-4AG-OI5-GW

5/2/11 1700 W

3

6 11-4AG-TB-O4

4/29/11 1200 W

3

Signature

Company

Date

Time

Comments/Special Instructions

Yana Yushkova

OASIS Enviro.
QSE

5/4/11
5/5/11

1000
1230

*Report PCE,TCE,cis & trans-1,2-DCE;
1,1-DCE, and vinyl chloride only

Note: trip blanks contain headspace

Received

Relinquished

Received

Reviewed/Date

Reviewed/Date

Chromatograms with final report ☐

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6/2/2011

Mr. Tim McDougall
Oasis Environmental, Inc.
825 W. 8th Avenue
Suite 200
Anchorage AK 99501

Project Name: 4th & Gambell
Project #: 14-200-02-3
Workorder #: 1105152R1

Dear Mr. Tim McDougall

The following report includes the data for the above referenced project for sample(s) received on 5/9/2011 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner
Project Manager

WORK ORDER #: 1105152R1

Work Order Summary

CLIENT: Mr. Tim McDougall
Oasis Environmental, Inc.
825 W. 8th Avenue
Suite 200
Anchorage, AK 99501

PHONE: 907-258-4880

FAX:

DATE RECEIVED: 05/09/2011

DATE COMPLETED: 05/20/2011

DATE REISSUED: 06/02/2011

BILL TO: Mr. Tim McDougall
Oasis Environmental, Inc.
825 W. 8th Avenue
Suite 200
Anchorage, AK 99501

P.O. # 1443

PROJECT # 14-200-02-3 4th & Gambell

CONTACT: Kelly Buettner

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	11-4AG-016-SG	Modified TO-15	1.8 "Hg	15 psi
02A	11-4AG-017-SG	Modified TO-15	5.6 "Hg	15 psi
03A	11-4AG-018-SG	Modified TO-15	2.6 "Hg	15 psi
04A	11-4AG-019-SG	Modified TO-15	1.8 "Hg	15 psi
05A	11-4AG-021-SG	Modified TO-15	3.4 "Hg	15 psi
06A	11-4AG-022-SG	Modified TO-15	2.0 "Hg	15 psi
07A	11-4AG-023-SG	Modified TO-15	2.6 "Hg	15 psi
08A	11-4AG-024-SG	Modified TO-15	1.8 "Hg	15 psi
09A	11-4AG-025-SG	Modified TO-15	1.8 "Hg	15 psi
10A	11-4AG-026-SG	Modified TO-15	2.2 "Hg	15 psi
11A	11-4AG-TB-03 (trip blank)	Modified TO-15	27.2 "Hg	15 psi
12A	Lab Blank	Modified TO-15	NA	NA
13A	CCV	Modified TO-15	NA	NA
14A	LCS	Modified TO-15	NA	NA
14AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY:



Laboratory Director

DATE: 06/02/11

Certification numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763,
NY NELAP - 11291, UT NELAP - 9166389892, AZ Licensure AZ0719

Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,

Accreditation number: E87680, Effective date: 07/01/09, Expiration date: 06/30/11

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Air Toxics Ltd.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**LABORATORY NARRATIVE
EPA Method TO-15
Oasis Environmental, Inc.
Workorder# 1105152R1**

Eleven 1 Liter Summa Canister samples were received on May 09, 2011. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

THE WORKORDER WAS REISSUED ON JUNE 02, 2011 TO REPORT 1,1-DICHLOROETHENE.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV and/or LCS.

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

Summary of Detected Compounds EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 11-4AG-016-SG

Lab ID#: 1105152R1-01A

No Detections Were Found.

Client Sample ID: 11-4AG-017-SG

Lab ID#: 1105152R1-02A

No Detections Were Found.

Client Sample ID: 11-4AG-018-SG

Lab ID#: 1105152R1-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.1	3.3	7.5	22

Client Sample ID: 11-4AG-019-SG

Lab ID#: 1105152R1-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.1	12	7.3	82

Client Sample ID: 11-4AG-021-SG

Lab ID#: 1105152R1-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.1	1.4	6.1	7.7

Client Sample ID: 11-4AG-022-SG

Lab ID#: 1105152R1-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.1	6.2	5.8	33
Tetrachloroethene	1.1	1.9	7.3	13

**Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN**

Client Sample ID: 11-4AG-023-SG

Lab ID#: 1105152R1-07A

No Detections Were Found.

Client Sample ID: 11-4AG-024-SG

Lab ID#: 1105152R1-08A

No Detections Were Found.

Client Sample ID: 11-4AG-025-SG

Lab ID#: 1105152R1-09A

No Detections Were Found.

Client Sample ID: 11-4AG-026-SG

Lab ID#: 1105152R1-10A

No Detections Were Found.

Client Sample ID: 11-4AG-TB-03 (trip blank)

Lab ID#: 1105152R1-11A

No Detections Were Found.

Client Sample ID: 11-4AG-016-SG

Lab ID#: 1105152R1-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051807	Date of Collection: 5/4/11 1:35:00 PM
Dil. Factor:	2.15	Date of Analysis: 5/18/11 11:29 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.7	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.3	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Trichloroethene	1.1	Not Detected	5.8	Not Detected
trans-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Tetrachloroethene	1.1	Not Detected	7.3	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	99	70-130

Client Sample ID: 11-4AG-017-SG

Lab ID#: 1105152R1-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051808	Date of Collection: 5/4/11 3:20:00 PM
Dil. Factor:	2.48	Date of Analysis: 5/18/11 11:55 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.9	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Trichloroethene	1.2	Not Detected	6.7	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Tetrachloroethene	1.2	Not Detected	8.4	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	102	70-130

Client Sample ID: 11-4AG-018-SG

Lab ID#: 1105152R1-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051809	Date of Collection: 5/3/11 5:00:00 PM
Dil. Factor:	2.21	Date of Analysis: 5/18/11 12:23 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.8	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.4	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.4	Not Detected
Trichloroethene	1.1	Not Detected	5.9	Not Detected
trans-1,2-Dichloroethene	1.1	Not Detected	4.4	Not Detected
Tetrachloroethene	1.1	3.3	7.5	22

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	96	70-130

Client Sample ID: 11-4AG-019-SG

Lab ID#: 1105152R1-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051810	Date of Collection: 5/3/11 6:00:00 PM
Dil. Factor:	2.15	Date of Analysis: 5/18/11 12:47 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.7	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.3	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Trichloroethene	1.1	Not Detected	5.8	Not Detected
trans-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Tetrachloroethene	1.1	12	7.3	82

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	98	70-130

Client Sample ID: 11-4AG-021-SG

Lab ID#: 1105152R1-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051811	Date of Collection: 5/4/11 7:15:00 PM
Dil. Factor:	2.28	Date of Analysis: 5/18/11 01:24 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.9	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.5	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.5	Not Detected
Trichloroethene	1.1	1.4	6.1	7.7
trans-1,2-Dichloroethene	1.1	Not Detected	4.5	Not Detected
Tetrachloroethene	1.1	Not Detected	7.7	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	104	70-130

Client Sample ID: 11-4AG-022-SG

Lab ID#: 1105152R1-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051812	Date of Collection: 4/29/11 3:40:00 PM
Dil. Factor:	2.16	Date of Analysis: 5/18/11 01:51 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.8	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.3	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Trichloroethene	1.1	6.2	5.8	33
trans-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Tetrachloroethene	1.1	1.9	7.3	13

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	100	70-130

Client Sample ID: 11-4AG-023-SG

Lab ID#: 1105152R1-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051813	Date of Collection: 4/29/11 5:25:00 PM
Dil. Factor:	2.21	Date of Analysis: 5/18/11 02:14 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.8	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.4	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.4	Not Detected
Trichloroethene	1.1	Not Detected	5.9	Not Detected
trans-1,2-Dichloroethene	1.1	Not Detected	4.4	Not Detected
Tetrachloroethene	1.1	Not Detected	7.5	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	100	70-130

Client Sample ID: 11-4AG-024-SG

Lab ID#: 1105152R1-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051814	Date of Collection: 5/4/11 5:55:00 PM
Dil. Factor:	2.15	Date of Analysis: 5/18/11 02:38 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.7	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.3	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Trichloroethene	1.1	Not Detected	5.8	Not Detected
trans-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Tetrachloroethene	1.1	Not Detected	7.3	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	94	70-130

Client Sample ID: 11-4AG-025-SG

Lab ID#: 1105152R1-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051815	Date of Collection: 4/29/11 1:10:00 PM
Dil. Factor:	2.15	Date of Analysis: 5/18/11 02:58 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.7	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.3	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Trichloroethene	1.1	Not Detected	5.8	Not Detected
trans-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Tetrachloroethene	1.1	Not Detected	7.3	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	96	70-130

Client Sample ID: 11-4AG-026-SG

Lab ID#: 1105152R1-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051816	Date of Collection: 5/4/11 2:00:00 PM
Dil. Factor:	2.18	Date of Analysis: 5/18/11 03:27 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.8	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.3	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Trichloroethene	1.1	Not Detected	5.8	Not Detected
trans-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Tetrachloroethene	1.1	Not Detected	7.4	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	96	70-130

Client Sample ID: 11-4AG-TB-03 (trip blank)

Lab ID#: 1105152R1-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051817	Date of Collection: 4/22/11 12:00:00 PM
Dil. Factor:	1.00	Date of Analysis: 5/18/11 03:51 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	98	70-130

Client Sample ID: Lab Blank

Lab ID#: 1105152R1-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051806	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/18/11 10:54 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	97	70-130

Client Sample ID: CCV

Lab ID#: 1105152R1-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051803	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/18/11 09:22 AM

Compound	%Recovery
Vinyl Chloride	74
1,1-Dichloroethene	87
cis-1,2-Dichloroethene	88
Trichloroethene	89
trans-1,2-Dichloroethene	89
Tetrachloroethene	86

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	107	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	103	70-130

Client Sample ID: LCS

Lab ID#: 1105152R1-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051804	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/18/11 09:53 AM

Compound	%Recovery
Vinyl Chloride	77
1,1-Dichloroethene	94
cis-1,2-Dichloroethene	90
Trichloroethene	96
trans-1,2-Dichloroethene	101
Tetrachloroethene	88

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	108	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	101	70-130

Client Sample ID: LCSD

Lab ID#: 1105152R1-14AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3051805	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 5/18/11 10:22 AM

Compound	%Recovery
Vinyl Chloride	75
1,1-Dichloroethene	94
cis-1,2-Dichloroethene	91
Trichloroethene	97
trans-1,2-Dichloroethene	99
Tetrachloroethene	87

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	104	70-130



CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
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FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Page 1 of 2

Project Manager Lisa Nicholson

Collected by: (Print and Sign) Lisa Nicholson the

Company CAEIS Environmental Email l.nicholson@caeisenv

Address 825 W. 8th Ave City Anchorage State AK Zip 99501

Phone (907) 264-4460 Fax (907) 258-4033

Project Info: Quote: 2101116488RD

P.O. # 1443

Project # 14-200-02-3

Project Name 4th & Gambell

Turn Around Time:

☒ Normal

☐ Rush

Lab Use Only Pressurized by:

Date:

Pressurization Gas:

specify

N₂

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Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum
01A	11-4AG-016-SG	31714	5/14/2011	1335	VOCs Modified To-15	29.5 5"
02A	11-4AG-017-SG	36450	5/14/2011	1520	"	29.5 4"
03A	11-4AG-018-SG	9311	5/3/2011	1700	"	30 5"
04A	11-4AG-019-SG	35562	5/3/2011	1810	"	29 5"
05A	11-4AG-020-SG	37433	5/14/2011	1915	"	29.5 5"
06A	11-4AG-022-SG	2366	4/29/2011	1540	"	30 5"
07A	11-4AG-023-SG	35670	4/29/2011	1725	"	30 5"
08A	11-4AG-024-SG	2063	5/14/2011	1755	"	29 5"
09A	11-4AG-025-SG	2145	4/29/2011	1310	"	29.5 5"
10A	11-4AG-026-SG	37303	5/14/2011	1400	"	29.5 5"

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time	Notes:
<u>the</u>	<u>5/16/2011 1200</u>	<u>B. Stettin</u>	<u>5/16/11 0905</u>	Report chlorinated alkenes only: PCE; TCE; cis & trans-1,2-DCE; 1,1-DCE; and vinyl chloride
				* See note re vacuum on tag

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	<u>Federal</u>		<u>6A</u>	<u>Good</u>	<u>Yes</u> <u>No</u> <u>None</u>	<u>1105152</u>

CHAIN-OF-CUSTODY RECORD

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FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020**

Page 2 of 2

Project Manager Lisa Nicholson

Collected by: (Print and Sign) Lisa Nicholson

Company ASIS Environmental Email l.michelson@asisenviro.com

Address 825 W. 8th Ave. City Anchorage State AK Zip 99501

Phone (901) 264-4460 Fax (907) 258-4033

Project Info: Quote: 01000916480120

P.O. # 1443

Project # 14-200-02-3

Project Name 475 of Gambell

Turn Around Time:

☒ Normal☐ Rush

Lab Use Only
Pressurized by

Date:

Pressurization Gas:

He	N_2
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[illegible]

Relinquished by: (signature) Date/Time 12:07

Received by: (signature) Date/Time

Notes:

Relinquished by: (signature) Date/Time

Received by: (signature) Date/Time

Report chlorinated alkenes only:
4. trans-1,2-DCP

Relinquished by: (signature) Date/Time

Received by: (signature) Date/Time

3. cis-1,2- DCE & Vinyl chloride

Shipper Name

Air Bill #

Temp (°C)

Condition

Custody Seals Intact?

Work Order #

Only

1000

272

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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2007-07-07

[illegible]

12/8/2011

Mr. Tim McDougall
Oasis Environmental, Inc.
825 W. 8th Avenue
Suite 200
Anchorage AK 99501

Project Name: 4th & Gambell
Project #: 0146933-2-4
Workorder #: 1111426

Dear Mr. Tim McDougall

The following report includes the data for the above referenced project for sample(s) received on 11/23/2011 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner
Project Manager

WORK ORDER #: 1111426

Work Order Summary

CLIENT:	Mr. Tim McDougall Oasis Environmental, Inc. 825 W. 8th Avenue Suite 200 Anchorage, AK 99501	BILL TO:	Mr. Tim McDougall Oasis Environmental, Inc. 825 W. 8th Avenue Suite 200 Anchorage, AK 99501
PHONE:	907-258-4880	P.O. #	1749
FAX:		PROJECT #	0146933-2-4 4th & Gambell
DATE RECEIVED:	11/23/2011	CONTACT:	Kelly Buettner
DATE COMPLETED:	12/08/2011		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	11-4AG-027-SG	Modified TO-15	0.5 "Hg	5 psi
02A	11-4AG-028-SG	Modified TO-15	0.5 "Hg	5 psi
03A	11-4AG-029-SG	Modified TO-15	1.0 "Hg	5 psi
04A	11-4AG-030-SG	Modified TO-15	1.0 "Hg	5 psi
05A	11-4AG-031-SG	Modified TO-15	5.0 "Hg	5 psi
06A	11-4AG-032-SG	Modified TO-15	4.2 "Hg	5 psi
07A	11-4AG-033-SG	Modified TO-15	3.5 "Hg	5 psi
08A	11-4AG-034-SG	Modified TO-15	0.0 "Hg	5 psi
09A	11-4AG-035-SG	Modified TO-15	2.0 "Hg	5 psi
10A	11-4AG-036-SG	Modified TO-15	0.2 "Hg	5 psi
11A	Lab Blank	Modified TO-15	NA	NA
11B	Lab Blank	Modified TO-15	NA	NA
12A	CCV	Modified TO-15	NA	NA
12B	CCV	Modified TO-15	NA	NA
13A	LCS	Modified TO-15	NA	NA
13AA	LCSD	Modified TO-15	NA	NA
13B	LCS	Modified TO-15	NA	NA

Continued on next page

WORK ORDER #: 1111426

Work Order Summary

CLIENT:	Mr. Tim McDougall Oasis Environmental, Inc. 825 W. 8th Avenue Suite 200 Anchorage, AK 99501	BILL TO:	Mr. Tim McDougall Oasis Environmental, Inc. 825 W. 8th Avenue Suite 200 Anchorage, AK 99501
PHONE:	907-258-4880	P.O. #	1749
FAX:		PROJECT #	0146933-2-4 4th & Gambell
DATE RECEIVED:	11/23/2011	CONTACT:	Kelly Buettner
DATE COMPLETED:	12/08/2011		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
13BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY:



Laboratory Director

DATE: 12/08/11

Certification numbers: AZ Licensure AZ0719, CA NELAP - 02110CA, LA NELAP - 02089,
NY NELAP - 11291, TX NELAP - T104704434-11-3, UT NELAP -CA009332011-1, WA NELAP - C935
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/11 , Expiration date: 06/30/12.

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**LABORATORY NARRATIVE
EPA Method TO-15
Oasis Environmental, Inc.
Workorder# 1111426**

Ten 1 Liter Summa Canister samples were received on November 23, 2011. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV and/or LCS.

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

Summary of Detected Compounds EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 11-4AG-027-SG

Lab ID#: 1111426-01A

No Detections Were Found.

Client Sample ID: 11-4AG-028-SG

Lab ID#: 1111426-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.68	1.7	3.6	9.1

Client Sample ID: 11-4AG-029-SG

Lab ID#: 1111426-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.70	0.73	3.7	3.9

Client Sample ID: 11-4AG-030-SG

Lab ID#: 1111426-04A

No Detections Were Found.

Client Sample ID: 11-4AG-031-SG

Lab ID#: 1111426-05A

No Detections Were Found.

Client Sample ID: 11-4AG-032-SG

Lab ID#: 1111426-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.78	8.5	4.2	46
Tetrachloroethene	0.78	4.3	5.3	29

Client Sample ID: 11-4AG-033-SG

Lab ID#: 1111426-07A

Summary of Detected Compounds EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: 11-4AG-033-SG

Lab ID#: 1111426-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.76	8.2	4.1	44
Tetrachloroethene	0.76	4.2	5.2	29

Client Sample ID: 11-4AG-034-SG

Lab ID#: 1111426-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.67	3.2	4.5	22

Client Sample ID: 11-4AG-035-SG

Lab ID#: 1111426-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	0.72	25	4.9	170

Client Sample ID: 11-4AG-036-SG

Lab ID#: 1111426-10A

No Detections Were Found.

Client Sample ID: 11-4AG-027-SG

Lab ID#: 1111426-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112810	Date of Collection: 11/16/11 5:00:00 PM
Dil. Factor:	1.36	Date of Analysis: 11/28/11 05:16 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.68	Not Detected	1.7	Not Detected
1,1-Dichloroethene	0.68	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.68	Not Detected	2.7	Not Detected
Trichloroethene	0.68	Not Detected	3.6	Not Detected
trans-1,2-Dichloroethene	0.68	Not Detected	2.7	Not Detected
Tetrachloroethene	0.68	Not Detected	4.6	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	85	70-130
1,2-Dichloroethane-d4	82	70-130
4-Bromofluorobenzene	102	70-130

Client Sample ID: 11-4AG-028-SG

Lab ID#: 1111426-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112811	Date of Collection: 11/17/11 10:15:00 A
Dil. Factor:	1.36	Date of Analysis: 11/28/11 05:54 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.68	Not Detected	1.7	Not Detected
1,1-Dichloroethene	0.68	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.68	Not Detected	2.7	Not Detected
Trichloroethene	0.68	1.7	3.6	9.1
trans-1,2-Dichloroethene	0.68	Not Detected	2.7	Not Detected
Tetrachloroethene	0.68	Not Detected	4.6	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	85	70-130
1,2-Dichloroethane-d4	81	70-130
4-Bromofluorobenzene	100	70-130

Client Sample ID: 11-4AG-029-SG

Lab ID#: 1111426-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112812	Date of Collection: 11/17/11 11:10:00 A
Dil. Factor:	1.39	Date of Analysis: 11/28/11 06:31 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.70	Not Detected	1.8	Not Detected
1,1-Dichloroethene	0.70	Not Detected	2.8	Not Detected
cis-1,2-Dichloroethene	0.70	Not Detected	2.8	Not Detected
Trichloroethene	0.70	0.73	3.7	3.9
trans-1,2-Dichloroethene	0.70	Not Detected	2.8	Not Detected
Tetrachloroethene	0.70	Not Detected	4.7	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	85	70-130
1,2-Dichloroethane-d4	83	70-130
4-Bromofluorobenzene	102	70-130

Client Sample ID: 11-4AG-030-SG

Lab ID#: 1111426-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112813	Date of Collection: 11/17/11 12:00:00 P
Dil. Factor:	1.39	Date of Analysis: 11/28/11 07:08 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.70	Not Detected	1.8	Not Detected
1,1-Dichloroethene	0.70	Not Detected	2.8	Not Detected
cis-1,2-Dichloroethene	0.70	Not Detected	2.8	Not Detected
Trichloroethene	0.70	Not Detected	3.7	Not Detected
trans-1,2-Dichloroethene	0.70	Not Detected	2.8	Not Detected
Tetrachloroethene	0.70	Not Detected	4.7	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	85	70-130
1,2-Dichloroethane-d4	82	70-130
4-Bromofluorobenzene	98	70-130

Client Sample ID: 11-4AG-031-SG

Lab ID#: 1111426-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112918	Date of Collection: 11/17/11 2:00:00 PM
Dil. Factor:	1.61	Date of Analysis: 11/29/11 09:27 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.80	Not Detected	2.0	Not Detected
1,1-Dichloroethene	0.80	Not Detected	3.2	Not Detected
cis-1,2-Dichloroethene	0.80	Not Detected	3.2	Not Detected
Trichloroethene	0.80	Not Detected	4.3	Not Detected
trans-1,2-Dichloroethene	0.80	Not Detected	3.2	Not Detected
Tetrachloroethene	0.80	Not Detected	5.5	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	86	70-130
1,2-Dichloroethane-d4	83	70-130
4-Bromofluorobenzene	102	70-130

Client Sample ID: 11-4AG-032-SG

Lab ID#: 1111426-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112919	Date of Collection: 11/17/11 3:15:00 PM
Dil. Factor:	1.56	Date of Analysis: 11/29/11 10:05 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.78	Not Detected	2.0	Not Detected
1,1-Dichloroethene	0.78	Not Detected	3.1	Not Detected
cis-1,2-Dichloroethene	0.78	Not Detected	3.1	Not Detected
Trichloroethene	0.78	8.5	4.2	46
trans-1,2-Dichloroethene	0.78	Not Detected	3.1	Not Detected
Tetrachloroethene	0.78	4.3	5.3	29

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	86	70-130
1,2-Dichloroethane-d4	83	70-130
4-Bromofluorobenzene	100	70-130

Client Sample ID: 11-4AG-033-SG

Lab ID#: 1111426-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112920	Date of Collection: 11/17/11 3:30:00 PM
Dil. Factor:	1.52	Date of Analysis: 11/29/11 10:42 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.76	Not Detected	1.9	Not Detected
1,1-Dichloroethene	0.76	Not Detected	3.0	Not Detected
cis-1,2-Dichloroethene	0.76	Not Detected	3.0	Not Detected
Trichloroethene	0.76	8.2	4.1	44
trans-1,2-Dichloroethene	0.76	Not Detected	3.0	Not Detected
Tetrachloroethene	0.76	4.2	5.2	29

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	85	70-130
1,2-Dichloroethane-d4	84	70-130
4-Bromofluorobenzene	101	70-130

Client Sample ID: 11-4AG-034-SG

Lab ID#: 1111426-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112921	Date of Collection: 11/18/11 9:40:00 AM
Dil. Factor:	1.34	Date of Analysis: 11/29/11 11:20 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.67	Not Detected	1.7	Not Detected
1,1-Dichloroethene	0.67	Not Detected	2.6	Not Detected
cis-1,2-Dichloroethene	0.67	Not Detected	2.6	Not Detected
Trichloroethene	0.67	Not Detected	3.6	Not Detected
trans-1,2-Dichloroethene	0.67	Not Detected	2.6	Not Detected
Tetrachloroethene	0.67	3.2	4.5	22

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	85	70-130
1,2-Dichloroethane-d4	83	70-130
4-Bromofluorobenzene	100	70-130

Client Sample ID: 11-4AG-035-SG

Lab ID#: 1111426-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112922	Date of Collection: 11/18/11 10:15:00 A
Dil. Factor:	1.44	Date of Analysis: 11/29/11 11:58 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.72	Not Detected	1.8	Not Detected
1,1-Dichloroethene	0.72	Not Detected	2.8	Not Detected
cis-1,2-Dichloroethene	0.72	Not Detected	2.8	Not Detected
Trichloroethene	0.72	Not Detected	3.9	Not Detected
trans-1,2-Dichloroethene	0.72	Not Detected	2.8	Not Detected
Tetrachloroethene	0.72	25	4.9	170

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	84	70-130
1,2-Dichloroethane-d4	84	70-130
4-Bromofluorobenzene	98	70-130

Client Sample ID: 11-4AG-036-SG

Lab ID#: 1111426-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112923	Date of Collection: 11/18/11 11:10:00 A
Dil. Factor:	1.35	Date of Analysis: 11/30/11 12:35 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.68	Not Detected	1.7	Not Detected
1,1-Dichloroethene	0.68	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.68	Not Detected	2.7	Not Detected
Trichloroethene	0.68	Not Detected	3.6	Not Detected
trans-1,2-Dichloroethene	0.68	Not Detected	2.7	Not Detected
Tetrachloroethene	0.68	Not Detected	4.6	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	85	70-130
1,2-Dichloroethane-d4	84	70-130
4-Bromofluorobenzene	101	70-130

Client Sample ID: Lab Blank

Lab ID#: 1111426-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112809	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 11/28/11 03:41 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	86	70-130
1,2-Dichloroethane-d4	82	70-130
4-Bromofluorobenzene	100	70-130

Client Sample ID: Lab Blank

Lab ID#: 1111426-11B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112908a	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 11/29/11 02:14 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	86	70-130
1,2-Dichloroethane-d4	84	70-130
4-Bromofluorobenzene	100	70-130

Client Sample ID: CCV

Lab ID#: 1111426-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112802	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 11/28/11 10:21 AM

Compound	%Recovery
Vinyl Chloride	88
1,1-Dichloroethene	101
cis-1,2-Dichloroethene	100
Trichloroethene	98
trans-1,2-Dichloroethene	101
Tetrachloroethene	100

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	87	70-130
1,2-Dichloroethane-d4	82	70-130
4-Bromofluorobenzene	104	70-130

Client Sample ID: CCV

Lab ID#: 1111426-12B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112902	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 11/29/11 10:29 AM

Compound	%Recovery
Vinyl Chloride	83
1,1-Dichloroethene	97
cis-1,2-Dichloroethene	98
Trichloroethene	97
trans-1,2-Dichloroethene	98
Tetrachloroethene	99

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	86	70-130
1,2-Dichloroethane-d4	84	70-130
4-Bromofluorobenzene	104	70-130

Client Sample ID: LCS

Lab ID#: 1111426-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112803	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 11/28/11 10:58 AM

Compound	%Recovery
Vinyl Chloride	99
1,1-Dichloroethene	120
cis-1,2-Dichloroethene	112
Trichloroethene	121
trans-1,2-Dichloroethene	124
Tetrachloroethene	111

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	87	70-130
1,2-Dichloroethane-d4	79	70-130
4-Bromofluorobenzene	102	70-130

Client Sample ID: LCSD

Lab ID#: 1111426-13AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112804	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 11/28/11 11:36 AM

Compound	%Recovery
Vinyl Chloride	96
1,1-Dichloroethene	118
cis-1,2-Dichloroethene	114
Trichloroethene	114
trans-1,2-Dichloroethene	126
Tetrachloroethene	114

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	87	70-130
1,2-Dichloroethane-d4	80	70-130
4-Bromofluorobenzene	103	70-130

Client Sample ID: LCS

Lab ID#: 1111426-13B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112903	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 11/29/11 11:07 AM

Compound	%Recovery
Vinyl Chloride	100
1,1-Dichloroethene	123
cis-1,2-Dichloroethene	116
Trichloroethene	128
trans-1,2-Dichloroethene	128
Tetrachloroethene	116

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	87	70-130
1,2-Dichloroethane-d4	80	70-130
4-Bromofluorobenzene	103	70-130

Client Sample ID: LCSD

Lab ID#: 1111426-13BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	m112904	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 11/29/11 11:44 AM

Compound	%Recovery
Vinyl Chloride	96
1,1-Dichloroethene	119
cis-1,2-Dichloroethene	113
Trichloroethene	115
trans-1,2-Dichloroethene	127
Tetrachloroethene	115

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	86	70-130
1,2-Dichloroethane-d4	81	70-130
4-Bromofluorobenzene	105	70-130

Laboratory Data Review Checklist

Completed by:	Melissa Pike		
Title:	Environmental Scientist	Date:	Dec 14, 2011
CS Report Name:	4th & GAMBELL, ANCHORAGE, AK	Report Date:	December 2011
Consultant Firm:	OASIS Environmental, Inc		
Laboratory Name:	OnSite Environmental	Laboratory Report Number:	1104-214
ADEC File Number:		ADEC RecKey Number:	

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

--

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

☐ Yes ☒ No ☐ NA (Please explain) Comments:

Samples were not subcontracted or transferred to another network laboratory.
--

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

☒ Yes ☐ No ☐ NA (Please explain) Comments:

--

b. Correct analyses requested?

☒ Yes ☐ No ☐ NA (Please explain) Comments:

--

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ} \text{C}$)?

☒ Yes ☐ No ☐ NA (Please explain) Comments:

Case narrative states samples were received within range. It is not documented on the COC.
--

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

Sample 11-4AG-010-SO is preserved. All other samples are unpreserved to measure moisture content.

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

Samples were reported in good condition.

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

There are no discrepancies.

e. Data quality or usability affected? (Please explain)

Comments:

Data quality and usability is not affect with respect to the laboratory receipt documentation.

4. Case Narrative

a. Present and understandable?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

b. Discrepancies, errors or QC failures identified by the lab?

☐ Yes ☒ No ☐ NA (Please explain)

Comments:

There are no discrepancies.

c. Were all corrective actions documented?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

There are no corrective actions.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality and usability is not affected.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

b. All applicable holding times met?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

c. All soils reported on a dry weight basis?

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

There are no soil samples in this sample delivery group.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

e. Data quality or usability affected? (Please explain)

Comments:

Data quality and usability is not affected with respect to the reported sample results.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

ii. All method blank results less than PQL?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

iii. If above PQL, what samples are affected?

Comments:

NA. All results are ND.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes

☐ No

☒ NA (Please explain)

Comments:

NA. All results are ND.

v. Data quality or usability affected? (Please explain)

Comments:

Data quality and usability is not affected with respect to the reported method blank results.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☐ Yes

☒ No

☐ NA (Please explain)

Comments:

There is no LCS/LCSD. There is an MS/MSD.

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

☐ Yes

☐ No

☒ NA (Please explain)

Comments:

There are no metals or inorganic analyses.

iii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

☒ Yes

☐ No

☐ NA (Please explain)

Comments:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

☒ Yes

☐ No

☐ NA (Please explain)

Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA. All results are within acceptable limits.

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain) Comments:

NA. All results are within acceptable limits.

vii. Data quality or usability affected? (Please explain) Comments:

Data quality and usability is not affected with respect to the reported LCS/LCSD results.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

☒ Yes ☐ No ☐ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

☒ Yes ☐ No ☐ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain) Comments:

There are no other data flags or qualifiers.

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

Data quality and usability is not affected with respect to the reported surrogate results.

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

All results are ND.

iv. If above PQL, what samples are affected?

Comments:

NA. All results are ND.

v. Data quality or usability affected? (Please explain.)

Comments:

Data quality and usability are not affected with respect to the reported trip blank results.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

There was one field duplicate -- primary 11-4AG-002-SO with duplicate 11-4AG-009-SO.

ii. Submitted blind to lab?

☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

☐ Yes ☒ No ☐ NA (Please explain.)

Comments:

Data quality and usability is not affected with respect to the reported field duplicate results.

f. Decontamination or Equipment Blank (if applicable)

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

All sampling materials were disposable. No decontamination or equipment blank was required.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

All sampling materials were disposable. No decontamination or equipment blank was required.

ii. If above PQL, what samples are affected?

Comments:

NA. All sampling materials were disposable. No decontamination or equipment blank was required.

iii. Data quality or usability affected? (Please explain.)

Comments:

NA. All sampling materials were disposable. No decontamination or equipment blank was required.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

There are no other data flags or qualifiers.

Reset Form

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Laboratory Data Review Checklist

Completed by:	Melissa Pike		
Title:	Associate Environmental Scientist	Date:	Dec 14, 2011
CS Report Name:	Site Characterization Report, Alaska Real Estate Parking Lot	Report Date:	December 2011
Consultant Firm:	OASIS Environmental Inc		
Laboratory Name:	OnSite Environmental Inc	Laboratory Report Number:	1105-045
ADEC File Number:		ADEC RecKey Number:	

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

--

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

☐ Yes ☐ No ☒ NA (Please explain) Comments:

Samples were not transferred or subcontracted.
--

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

☒ Yes ☐ No ☐ NA (Please explain) Comments:

--

b. Correct analyses requested?

☒ Yes ☐ No ☐ NA (Please explain) Comments:

--

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ} \text{C}$)?

☒ Yes ☐ No ☐ NA (Please explain) Comments:

--

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

Samples were received in good condition.

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

There were no discrepancies.

e. Data quality or usability affected? (Please explain)

Comments:

Data quality and usability are not affected with respect to the laboratory sample receipt documentation.

4. Case Narrative

a. Present and understandable?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

b. Discrepancies, errors or QC failures identified by the lab?

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

There are no discrepancies, errors or QC failures.

c. Were all corrective actions documented?

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

There are no corrective actions.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality and usability is not impacted with respect to the case narrative.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

b. All applicable holding times met?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

c. All soils reported on a dry weight basis?

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

There are no soil samples.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

e. Data quality or usability affected? (Please explain)

Comments:

Data quality and usability is not affected with respect to the reported sample results.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

ii. All method blank results less than PQL?

☒ Yes ☐ No ☐ NA (Please explain)

Comments:

iii. If above PQL, what samples are affected?

Comments:

NA.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes

☐ No

☒ NA (Please explain)

Comments:

There are no affected samples.

v. Data quality or usability affected? (Please explain)

Comments:

Data quality and usability is not affected with respect to the reported method blank results.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☐ Yes

☒ No

☐ NA (Please explain)

Comments:

LCS/LCSD was not performed. MS/MSD was performed.

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples?

☐ Yes

☐ No

☒ NA (Please explain)

Comments:

There are no metal or inorganic analysis.

iii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

☒ Yes

☐ No

☐ NA (Please explain)

Comments:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

☒ Yes

☐ No

☐ NA (Please explain)

Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA.

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain) Comments:

There are no affected samples.

vii. Data quality or usability affected? (Please explain)

Comments:

Data quality and usability are not affected.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

☒ Yes ☐ No ☐ NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

☒ Yes ☐ No ☐ NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain) Comments:

There are no results with failed surrogate recoveries.

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

Data usability and quality is not affected.

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

iv. If above PQL, what samples are affected?

Comments:

NA.

v. Data quality or usability affected? (Please explain.)

Comments:

Data quality and usability is not affected with respect to the reported trip blank results.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

Primary sample 11-4AG-012-GW and duplicate 11-4AG-015-GW

ii. Submitted blind to lab?

☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \frac{\text{Absolute Value of: } (R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☒ Yes ☐ No ☐ NA (Please explain.)

Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

☐ Yes ☒ No ☐ NA (Please explain.)

Comments:

Data quality and usability is not affected with respect to the reported field duplicate results.

f. Decontamination or Equipment Blank (if applicable)

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

All sampling equipment was disposable.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

All sampling equipment was disposable.

ii. If above PQL, what samples are affected?

Comments:

All sampling equipment was disposable.

iii. Data quality or usability affected? (Please explain.)

Comments:

All sampling equipment was disposable.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

☐ Yes ☐ No ☒ NA (Please explain)

Comments:

There are no other additional data flags or qualifiers.

Reset Form

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Laboratory Data Review Checklist for Air Samples

Completed By:	Melissa Pike
Title:	Associate Environmental Scientist
Date:	12/14/2011
CS Report Name:	4th & Gambell
Report Date:	12/14/2011
Consultant Firm:	OASIS Environmental, Inc
Laboratory Name:	Air Toxics LTD
Laboratory Report Number:	1105152
ADEC File Number:	
ADEC Hazard ID:	

1. Laboratory

- a. Did a NELAP certified laboratory receive and
- perform
- all of the submitted sample analyses?

☒ Yes☐ No

Comments:

--

- b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

☐ Yes☒ No

Comments:

No samples were transferred or subcontracted.

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)?

☒ Yes☐ No

Comments:

--

- b. Correct analyses requested?

☒ Yes☐ No

Comments:

--

Laboratory Data Review Checklist for Air Samples

3. Laboratory Sample Receipt Documentation

- a. Sample condition documented- Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

☒ Yes☐ No

Comments:

- b. If there were any discrepancies, were they documented? For example, incorrect sample containers, sample holding times outside of acceptable range, insufficient of missing samples, canister not holding a vacuum, etc.?

☒ Yes☐ No

Comments:

- c. Data quality or usability affected? Please explain.

☐ Yes☒ No

Comments:

Data quality and usability is not affected with respect to the laboratory sample receipt documentation.

4. Case Narrative

- a. Present and understandable?

☒ Yes☐ No

Comments:

- b. Discrepancies, errors or QC failures identified by the lab?

☐ Yes☒ No

Comments:

There are no discrepancies, errors or QC failures.

- c. Were all corrective actions documented?

☐ Yes☒ No

Comments:

There are no corrective actions.

- d. What is the effect on data quality/usability according to the case narrative?

☐ Yes☒ No

Comments:

Data quality and usability is not affected with respect to the case narrative.

5. Sample Results

- a. Correct analyses performed/reported as requested on COC?

☒ Yes☐ No

Comments:

Laboratory Data Review Checklist for Air Samples

b. Samples analyzed within 30 days of collection or within the time required by the method?

☒ Yes

☐ No

Comments:

c. Is the data reported in micrograms per meter cube volume ($\mu\text{g}/\text{m}^3$)?

☒ Yes

☐ No

Comments:

d. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

☒ Yes

☐ No

Comments:

e. Data quality or usability affected? Please explain.

☐ Yes

☒ No

Comments:

Data quality and usability is not affected with respect to the reported sample results.

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

☒ Yes

☐ No

Comments:

ii. All method blank results less than PQL?

☒ Yes

☐ No

Comments:

iii. If above PQL, what samples are affected?

☐ Yes

☒ No

Comments:

NA. No results are above the PQL.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes

☒ No

Comments:

NA. No results are above the PQL.

v. Data quality or usability affected? Please explain.

☐ Yes

☒ No

Comments:

Data quality and usability is not affected with respect to the reported method blank results.

Laboratory Data Review Checklist for Air Samples

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

- i. Organics - One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

☒ Yes ☐ No

Comments:

- ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

☒ Yes ☐ No

Comments:

- iii. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

☒ Yes ☐ No

Comments:

- iv. If % R or RPD is outside of acceptable limits, what samples are affected?

☐ Yes ☒ No

Comments:

- v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☒ No

Comments:

- vi. Data quality or usability affected? Please explain.

☐ Yes ☒ No

Comments:

c. Surrogates - Organics Only

- i. Are surrogate recoveries reported for organic analyses - QC and laboratory samples?

☒ Yes ☐ No

Comments:

- ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits?

☒ Yes ☐ No

Comments:

Laboratory Data Review Checklist for Air Samples

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No

Comments:

NA. There are no failed surrogate recoveries.

iv. Data quality or usability affected? Please explain.

☐ Yes ☒ No

Comments:

Data quality and usability is not affected with respect to the reported surrogate results.

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 soil gas or indoor air samples?

☒ Yes ☐ No

Comments:

primary 11-4AG-016-SG with duplicate 11-4AG-026-SG

ii. Submitted blind to lab?

☒ Yes ☐ No

Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs?
(Recommended: 25%)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

☒ Yes ☐ No

Comments:

iv. Data quality or usability affected? Please explain.

☐ Yes ☒ No

Comments:

Data quality and usability is not affected with respect to the reported field duplicate results.

7. Other Data Flags/Qualifiers

a. Defined and appropriate?

☐ Yes ☒ No

Comments:

There are no other data flags or qualifiers.

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Laboratory Data Review Checklist for Air Samples

Completed By:	Melissa Pike
Title:	Associate Environmental Scientist
Date:	12/14/2011
CS Report Name:	4th & Gambell
Report Date:	12/13/2011
Consultant Firm:	OASIS Environmental, Inc
Laboratory Name:	Air Toxics LTD
Laboratory Report Number:	1111426
ADEC File Number:	
ADEC Hazard ID:	

1. Laboratory

- a. Did a NELAP certified laboratory receive and
- perform
- all of the submitted sample analyses?

☒ Yes☐ No

Comments:

--

- b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

☐ Yes☒ No

Comments:

No samples were transferred or subcontracted.

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)?

☒ Yes☐ No

Comments:

--

- b. Correct analyses requested?

☒ Yes☐ No

Comments:

--

Laboratory Data Review Checklist for Air Samples

3. Laboratory Sample Receipt Documentation

- a. Sample condition documented- Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

☒ Yes

☐ No

Comments:

- b. If there were any discrepancies, were they documented? For example, incorrect sample containers, sample holding times outside of acceptable range, insufficient of missing samples, canister not holding a vacuum, etc.?

☒ Yes

☐ No

Comments:

- c. Data quality or usability affected? Please explain.

☐ Yes

☒ No

Comments:

Data quality and usability is not affected with respect to the laboratory sample receipt documentation.

4. Case Narrative

- a. Present and understandable?

☒ Yes

☐ No

Comments:

- b. Discrepancies, errors or QC failures identified by the lab?

☐ Yes

☒ No

Comments:

There are no discrepancies, errors or QC failures.

- c. Were all corrective actions documented?

☐ Yes

☒ No

Comments:

There are no corrective actions.

- d. What is the effect on data quality/usability according to the case narrative?

☐ Yes

☒ No

Comments:

Data quality and usability is not affected with respect to the case narrative.

5. Sample Results

- a. Correct analyses performed/reported as requested on COC?

☒ Yes

☐ No

Comments:

Laboratory Data Review Checklist for Air Samples

b. Samples analyzed within 30 days of collection or within the time required by the method?

☒ Yes

☐ No

Comments:

c. Is the data reported in micrograms per meter cube volume ($\mu\text{g}/\text{m}^3$)?

☒ Yes

☐ No

Comments:

d. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

☒ Yes

☐ No

Comments:

e. Data quality or usability affected? Please explain.

☐ Yes

☒ No

Comments:

Data quality and usability is not affected with respect to the reported sample results.

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

☒ Yes

☐ No

Comments:

ii. All method blank results less than PQL?

☒ Yes

☐ No

Comments:

iii. If above PQL, what samples are affected?

☐ Yes

☒ No

Comments:

NA. No results are above the PQL.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes

☒ No

Comments:

NA. No results are above the PQL.

v. Data quality or usability affected? Please explain.

☐ Yes

☒ No

Comments:

Data quality and usability is not affected with respect to the reported method blank results.

Laboratory Data Review Checklist for Air Samples

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

- i. Organics - One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

☒ Yes ☐ No

Comments:

- ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

☒ Yes ☐ No

Comments:

- iii. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

☒ Yes ☐ No

Comments:

- iv. If % R or RPD is outside of acceptable limits, what samples are affected?

☐ Yes ☒ No

Comments:

- v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☐ Yes ☒ No

Comments:

- vi. Data quality or usability affected? Please explain.

☐ Yes ☒ No

Comments:

c. Surrogates - Organics Only

- i. Are surrogate recoveries reported for organic analyses - QC and laboratory samples?

☒ Yes ☐ No

Comments:

- ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits?

☒ Yes ☐ No

Comments:

Laboratory Data Review Checklist for Air Samples

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No

Comments:

NA. There are no failed surrogate recoveries.

iv. Data quality or usability affected? Please explain.

☐ Yes ☒ No

Comments:

Data quality and usability is not affected with respect to the reported surrogate results.

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 soil gas or indoor air samples?

☒ Yes ☐ No

Comments:

Primary 11-4AG-032-SG with duplicate 11-4AG-033-SG

ii. Submitted blind to lab?

☒ Yes ☐ No

Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs?
(Recommended: 25%)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

☒ Yes ☐ No

Comments:

iv. Data quality or usability affected? Please explain.

☐ Yes ☒ No

Comments:

Data quality and usability was not affected with respect to the reported field duplicate results.

7. Other Data Flags/Qualifiers

a. Defined and appropriate?

☐ Yes ☒ No

Comments:

There are no other data flags or qualifiers.

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APPENDIX F

Investigation Derived Waste Document

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May 13, 2011

Todd Blessing
Alaska Department of Environmental Conservation (ADEC)
Contaminated Sites
555 Cordova Street
Anchorage, AK 99501

Waste Determination for Purge Water from Alaska Real Estate Parking Lot Site Characterization

Dear Mr. Blessing:

We have received the soil and groundwater sample results from the site characterization performed between April 25 and May 4 around the PIP Printing building and the First Native Baptist Church. The results are included as an attachment. Note that no chlorinated compounds were detected in any of the soil samples. The groundwater sample from MW-8 contained 0.00024 mg/L of tetrachloroethene (PCE).

During the installation of the monitoring wells (MW-8 through MW-11), we generated two 55-gallon drums of soil cuttings. The non-detect results from the soil samples suggest that the soil cuttings are not impacted with PCE or its daughter products. After our telephone conversation, I spoke with John Tatham, the owner of PIP Printing, regarding spreading the clean soil on his property. He gave his approval, mentioning that he needs clean fill. OASIS proposes that we use the clean soil to fill in low areas on the PIP printing property, as suggested by Mr. Tatham.

During the development and sampling activities, we generated approximately 5 to 6 gallons of purge water per monitoring well. The water from the four wells is combined into a 55-gallon drum. Based on the sample results, the water contains a minute amount of PCE. OASIS proposes to treat the water as a non-regulated waste for the following reasons:

- Less than 220 lbs of hazardous waste were generated as part of the project (based on a maximum of 25 gallons of water). The site, therefore, falls within a conditionally exempt small quantity generator status for RCRA hazardous waste.
- No EPA Identification number exists for the site and there is no need to update generator status.

Mr. Todd Blessing
Page 2

OASIS requests ADEC approval to treat the purge water as non-regulated waste. Once we receive your approval we will contract Emerald Services, Inc. to manage and dispose of the water.

If you have any questions, please contact me at (907) 258-4880.

Sincerely,

OASIS Environmental, Inc.



Lisa Nicholson
Project Manager

Attachments:

1. Soil Analytical Results
2. Groundwater Analytical Results

From: [Blessing, Todd C \(DEC\)](#)
To: [Lisa Nicholson;](#)
cc: lianicholsonak@gmail.com; [Max Schwenne](#); [Tim McDougall](#);
Subject: RE: Waste determination for purge water from Alaska Real Estate Parking Lot Site Characterization
Date: Monday, May 16, 2011 1:08:42 PM

Lisa, your proposal to treat the purge water outlined in your letter as non regulated waste is approved. Best regards,

Todd Blessing
Environmental Program Specialist
Contaminated Sites Program
Department of Environmental Conservation
555 Cordova Street
Anchorage, Alaska 99501
Phone: (907) 269-7699
Fax: (907) 269-7507

-----Original Message-----

From: Lisa Nicholson [<mailto:L.Nicholson@oasisenviro.com>]
Sent: Monday, May 16, 2011 10:59 AM
To: Blessing, Todd C (DEC)
Cc: lianicholsonak@gmail.com; [Max Schwenne](#); [Tim McDougall](#)
Subject: Waste determination for purge water from Alaska Real Estate Parking Lot Site Characterization

Hi Todd,
Attached is a letter requesting approval to treat the purge water from the Alaska Real Estate Parking Lot Site Characterization as non-regulated waste. Please let me know if you have any questions.
Thanks,
Lisa

Lisa Nicholson, C.P.G
OASIS Environmental, Inc.
825 W. 8th Ave
Anchorage, AK 99501
Direct: 907-264-4460
Cell: 907-227-4391
Fax: 907-258-4033

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. EXEMPT		Manifest Document No. 14032A		2. Page 1 of 1	
3. Generator's Name and Mailing Address OASIS ENVIRONMENTAL 825 W 8TH AVE, SUITE 200 ANCHORAGE, AK 99501 (907) 258-4880		Site Address OASIS ENVIRONMENTAL 4TH AVE AND INGRA STREET ANCHORAGE, AK 99501					
4. Generator's Phone ()		6. US EPA ID Number AKR000004184		A. State Transporter's ID			
5. Transporter 1 Company Name EMERALD ALASKA, INC		8. US EPA ID Number		B. Transporter 1 Phone (907) 258-1558			
7. Transporter 2 Company Name		10. US EPA ID Number AKR000004184		C. State Transporter's ID			
9. Designated Facility Name and Site Address EMERALD ALASKA, INC. 2020 VIKING DRIVE ANCHORAGE, AK 99501				D. Transporter 2 Phone			
				E. State Facility's ID			
				F. Facility's Phone (907) 258-1558			
11. WASTE DESCRIPTION				12. Containers		13. Total Quantity	
				No. Type		Unit Wt./Vol.	
				a. MATERIAL NOT REGULATED BY D.O.T.		1 55 G	
				b. MATERIAL NOT REGULATED BY D.O.T.		1 55 G	
				c.			
d.							
G. Additional Descriptions of Materials Listed Above 1)AK02906 GROUNDWATER / IDW WATER 2)AK00503S ABSORBENTS AND RAGS WITH NO FREE LIQUIDS				H. Handling Codes for Wastes Listed Above			
15. Special Handling Instructions and Additional Information This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.							
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.							
Printed/Typed Name Lisa Nicholson for: Alaska Dept. of Envir. Conserv.				Signature <i>[Signature]</i>		Date Month Day Year 5 24 11	
17. Transporter 1 Acknowledgement of Receipt of Materials				Signature <i>[Signature]</i>		Date Month Day Year 5 24 11	
Printed/Typed Name Geoff GRIFFITH				Signature		Date	
18. Transporter 2 Acknowledgement of Receipt of Materials				Signature		Date	
Printed/Typed Name				Signature		Date	
19. Discrepancy Indication Space							
20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.							
Printed/Typed Name				Signature		Date	
						Month Day Year	

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY

APPENDIX G

Conceptual Site Model Forms

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Human Health Conceptual Site Model Scoping Form

Site Name: 4th and Gambell
File Number: 2100.38.434
Completed by: _____

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, a CSM graphic and text must be submitted with the site characterization work plan.

General Instructions: *Follow the italicized instructions in each section below.*

1. General Information:

Sources (*check potential sources at the site*)

- | | |
|--|---------------------------------------|
| <input checked="" type="checkbox"/> USTs | <input type="checkbox"/> Vehicles |
| <input type="checkbox"/> ASTs | <input type="checkbox"/> Landfills |
| <input type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers |
| <input checked="" type="checkbox"/> Drums | <input type="checkbox"/> Other: _____ |

Release Mechanisms (*check potential release mechanisms at the site*)

- | | |
|---------------------------------|---|
| <input type="checkbox"/> Spills | <input type="checkbox"/> Direct discharge |
| <input type="checkbox"/> Leaks | <input type="checkbox"/> Burning |
| | <input type="checkbox"/> Other: _____ |

Impacted Media (*check potentially-impacted media at the site*)

- | | |
|---|--|
| <input checked="" type="checkbox"/> Surface soil (0-2 feet bgs*) | <input type="checkbox"/> Groundwater |
| <input checked="" type="checkbox"/> Subsurface Soil (>2 feet bgs) | <input type="checkbox"/> Surface water |
| <input type="checkbox"/> Air | <input type="checkbox"/> Other: _____ |

Receptors (*check receptors that could be affected by contamination at the site*)

- | | |
|---|--|
| <input type="checkbox"/> Residents (adult or child) | <input type="checkbox"/> Site visitor |
| <input type="checkbox"/> Commercial or industrial worker | <input type="checkbox"/> Trespasser |
| <input type="checkbox"/> Construction worker | <input type="checkbox"/> Recreational user |
| <input type="checkbox"/> Subsistence harvester (i.e., gathers wild foods) | <input type="checkbox"/> Farmer |
| <input type="checkbox"/> Subsistence consumer (i.e., eats wild foods) | <input type="checkbox"/> Other: _____ |

* bgs – below ground surface

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact –

1 Incidental Soil Ingestion

Is soil contaminated anywhere between 0 and 15 feet bgs? ☒

Do people use the site or is there a chance they will use the site in the future? ☒

If both boxes are checked, label this pathway complete: Complete

2 Dermal Absorption of Contaminants from Soil

Is soil contaminated anywhere between 0 and 15 feet bgs? ☒

Do people use the site or is there a chance they will use the site in the future? ☒

Can the soil contaminants permeate the skin? (Contaminants listed below, or within the groups listed below, should be evaluated for dermal absorption). ☐

Arsenic	Lindane
Cadmium	PAHs
Chlordane	Pentachlorophenol
2,4-dichlorophenoxyacetic acid	PCBs
Dioxins	SVOCs
DDT	

If all of the boxes are checked, label this pathway complete: _____

b) Ingestion –

1 Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, OR are contaminants expected to migrate to groundwater in the future? ☒

Could the potentially affected groundwater be used as a current or future drinking water source? *Please note, only leave the box unchecked if ADEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.* ☒

If both the boxes are checked, label this pathway complete: Complete

2 Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water OR are contaminants expected to migrate to surface water in the future? ☒

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? *Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).* ☐

If both boxes are checked, label this pathway complete: _____

3 Ingestion of Wild Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild food? ☐

Do the site contaminants have the potential to bioaccumulate (*see Appendix A*)? ☐

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. the top 6 feet of soil, in groundwater that **could** be connected to surface water, etc.) ☐

If all of the boxes are checked, label this pathway complete: _____

c) Inhalation

1 Inhalation of Outdoor Air

Is soil contaminated anywhere between 0 and 15 feet bgs? ☒

Do people use the site or is there a chance they will use the site in the future? ☒

Are the contaminants in soil volatile (*See Appendix B*)? ☒

If all of the boxes are checked, label this pathway complete: Complete

2 Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be placed on the site in an area that could be affected by contaminant vapors? (i.e., within 100 feet, horizontally or vertically, of the contaminated soil or groundwater, or subject to “preferential pathways” that promote easy airflow, like utility conduits or rock fractures) ☒

Are volatile compounds present in soil or groundwater (*See Appendix C*)? ☒

If both boxes are checked, label this pathway complete: Complete

3. Additional Exposure Pathways: *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Exposure from this pathway may need to be assessed only in cases where DEC water-quality or drinking-water standards are not being applied as cleanup levels. Examples of conditions that may warrant further investigation include:

- Climate permits recreational use of waters for swimming,
- Climate permits exposure to groundwater during activities, such as construction, without protective clothing, or
- Groundwater or surface water is used for household purposes.

Check the box if further evaluation of this pathway is needed:

☐

Comments:

Inhalation of Volatile Compounds in Household Water

Exposure from this pathway may need to be assessed only in cases where DEC water-quality or drinking-water standards are not being applied as cleanup levels. Examples of conditions that may warrant further investigation include:

- The contaminated water is used for household purposes such as showering, laundering, and dish washing, and
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix B)

Check the box if further evaluation of this pathway is needed:

☐

Comments:

Inhalation of Fugitive Dust

Generally DEC soil ingestion cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway, although this is not true in the case of chromium. Examples of conditions that may warrant further investigation include:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers. This size can be inhaled and would be of concern for determining if this pathway is complete.

Check the box if further evaluation of this pathway is needed:

☐

Comments:

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during recreational or some types of subsistence activities. People then incidentally **ingest** sediment from normal hand-to-mouth activities. In addition, **dermal absorption of contaminants** may be of concern if people come in contact with sediment and the contaminants are able to permeate the skin (see dermal exposure to soil section). This type of exposure is rare but it should be investigated if:

- Climate permits recreational activities around sediment, and/or
- Community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

ADEC soil ingestion cleanup levels are protective of direct contact with sediment. If they are determined to be over-protective for sediment exposure at a particular site, other screening levels could be adopted or developed.

Check the box if further evaluation of this pathway is needed:

☐

Comments:

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

APPENDIX A

BIOACCUMULATIVE COMPOUNDS

Table A-1: List of Compounds of Potential Concern for Bioaccumulation

Organic compounds are identified as bioaccumulative if they have a BCF equal to or greater than 1,000 or a log K_{ow} greater than 3.5. Inorganic compounds are identified as bioaccumulative if they are listed as such by EPA (2000). Those compounds in Table X of 18 AAC 75.345 that are bioaccumulative, based on the definition above, are listed below.

Aldrin	DDT	Lead
Arsenic	Dibenzo(a,h)anthracene	Mercury
Benzo(a)anthracene	Dieldrin	Methoxychlor
Benzo(a)pyrene	Dioxin	Nickel
Benzo(b)fluoranthene	Endrin	PCBs
Benzo(k)fluoranthene	Fluoranthene	
Cadmium	Heptachlor	Pyrene
Chlordane	Heptachlor epoxide	Selenium
Chrysene	Hexachlorobenzene	Silver
Copper	Hexachlorocyclopentadiene	Toxaphene
DDD	Indeno(1,2,3-c,d)pyrene	Zinc
DDE		

Because BCF values can relatively easily be measured or estimated, the BCF is frequently used to determine the potential for a chemical to bioaccumulate. A compound with a BCF greater than 1,000 is considered to bioaccumulate in tissue (EPA 2004b).

For inorganic compounds, the BCF approach has not been shown to be effective in estimating the compound's ability to bioaccumulate. Information available, either through scientific literature or site-specific data, regarding the bioaccumulative potential of an inorganic site contaminant should be used to determine if the pathway is complete.

The list was developed by including organic compounds that either have a BCF equal to or greater than 1,000 or a log K_{ow} greater than 3.5 and inorganic compounds that are listed by the United States Environmental Protection Agency (EPA) as being bioaccumulative (EPA 2000). The BCF can also be estimated from a chemical's physical and chemical properties. A chemical's octanol-water partitioning coefficient (K_{ow}) along with defined regression equations can be used to estimate the BCF. EPA's Persistent, Bioaccumulative, and Toxic (PBT) Profiler (EPA 2004) can be used to estimate the BCF using the K_{ow} and linear regressions presented by Meylan et al. (1996). The PBT Profiler is located at <http://www.pbtprofiler.net/>. For compounds not found in the PBT Profiler, DEC recommends using a log K_{ow} greater than 3.5 to determine if a compound is bioaccumulative.

APPENDIX B

VOLATILE COMPOUNDS

Table B-1: List of Volatile Compounds of Potential Concern

Common volatile contaminants of concern at contaminated sites. A chemical is defined as volatile if the Henry's Law constant is 1×10^{-5} atm-m³/mol or greater and the molecular weight less than 200 g/mole (g/mole; EPA 2004a). Those compounds in Table X of 18 AAC 75.345 that are volatile, based on the definition above, are listed below.

Acenaphthene	1,4-dichlorobenzene	Pyrene
Acetone	1,1-dichloroethane	Styrene
Anthracene	1,2-dichloroethane	1,1,2,2-tetrachloroethane
Benzene	1,1-dichloroethylene	Tetrachloroethylene
Bis(2-chlorethyl)ether	Cis-1,2-dichloroethylene	Toluene
Bromodichloromethane	Trans-1,2-dichloroethylene	1,2,4-trichlorobenzene
Carbon disulfide	1,2-dichloropropane	1,1,1-trichloroethane
Carbon tetrachloride	1,3-dichloropropane	1,1,2-trichloroethane
Chlorobenzene	Ethylbenzene	Trichloroethylene
Chlorodibromomethane	Fluorene	Vinyl acetate
Chloroform	Methyl bromide	Vinyl chloride
2-chlorophenol	Methylene chloride	Xylenes
Cyanide	Naphthalene	GRO
1,2-dichlorobenzene	Nitrobenzene	DRO

APPENDIX C

COMPOUNDS OF CONCERN FOR VAPOR MIGRATION

Table C-1: List of Compounds of Potential Concern for the Vapor Migration

A chemical is considered sufficiently toxic if the vapor concentration of the pure component poses an incremental lifetime cancer risk greater than 10^{-6} or a non-cancer hazard index greater than 1. A chemical is considered sufficiently volatile if it's Henry's Law constant is 1×10^{-5} atm-m³/mol or greater.

Acenaphthene	Dibenzofuran	Hexachlorobenzene
Acetaldehyde	1,2-Dibromo-3-chloropropane	Hexachlorocyclopentadiene
Acetone	1,2-Dibromoethane (EDB)	Hexachloroethane
Acetonitrile	1,3-Dichlorobenzene	Hexane
Acetophenone	1,2-Dichlorobenzene	Hydrogen cyanide
Acrolein	1,4-Dichlorobenzene	Isobutanol
Acrylonitrile	2-Nitropropane	Mercury (elemental)
Aldrin	N-Nitroso-di-n-butylamine	Methacrylonitrile
alpha-HCH (alpha-BHC)	n-Propylbenzene	Methoxychlor
Benzaldehyde	o-Nitrotoluene	Methyl acetate
Benzene	o-Xylene	Methyl acrylate
Benzo(b)fluoranthene	p-Xylene	Methyl bromide
Benzylchloride	Pyrene	Methyl chloride chloromethane)
beta-Chloronaphthalene	sec-Butylbenzene	Methylcyclohexane
Biphenyl	Styrene	Methylene bromide
Bis(2-chloroethyl)ether	tert-Butylbenzene	Methylene chloride
Bis(2-chloroisopropyl)ether	1,1,1,2-Tetrachloroethane	Methylethylketone (2-butanone)
Bis(chloromethyl)ether	1,1,2,2-Tetrachloroethane	Methylisobutylketone
Bromodichloromethane	Tetrachloroethylene	Methylmethacrylate
Bromoform	Dichlorodifluoromethane	2-Methylnaphthalene
1,3-Butadiene	1,1-Dichloroethane	MTBE
Carbon disulfide	1,2-Dichloroethane	m-Xylene
Carbon tetrachloride	1,1-Dichloroethylene	Naphthalene
Chlordane	1,2-Dichloropropane	n-Butylbenzene
2-Chloro-1,3-butadiene (chloroprene)	1,3-Dichloropropene	Nitrobenzene
Chlorobenzene	Dieldrin	Toluene
1-Chlorobutane	Endosulfan	trans-1,2-Dichloroethylene
Chlorodibromomethane	Epichlorohydrin	1,1,2-Trichloro-1,2,2-trifluoroethane
Chlorodifluoromethane	Ethyl ether	1,2,4-Trichlorobenzene
Chloroethane (ethyl chloride)	Ethylacetate	1,1,2-Trichloroethane
Chloroform	Ethylbenzene	1,1,1-Trichloroethane
2-Chlorophenol	Ethylene oxide	Trichloroethylene
2-Chloropropane	Ethylmethacrylate	Trichlorofluoromethane
Chrysene	Fluorene	1,2,3-Trichloropropane
cis-1,2-Dichloroethylene	Furan	1,2,4-Trimethylbenzene
Crotonaldehyde (2-butenal)	Gamma-HCH (Lindane)	1,3,5-Trimethylbenzene
Cumene	Heptachlor	Vinyl acetate
DDE	Hexachloro-1,3-butadiene	Vinyl chloride (chloroethene)

Source: EPA 2002.

Guidance on Developing Conceptual Site Models
January 31, 2005

HUMAN HEALTH CONCEPTUAL SITE MODEL

Site: 4th and Gambell

Completed By: Lisa Nicholson

Date Completed: 3/18/2011

Follow the directions below. Do not consider engineering or land use controls when describing pathways.

(1)

Check the media that could be directly affected by the release.

(2)

For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Briefly list other mechanisms or reference the report for details.

(3)

Check exposure media identified in (2).

(4)

Check exposure pathways that are complete or need further evaluation. The pathways identified must agree with Sections 2 and 3 of the CSM Scoping Form.

(5)

Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, or "C/F" for both current and future receptors.

Media	Transport Mechanisms	Exposure Media	Exposure Pathways	Current & Future Receptors						
				Residents (adults or children)	Commercial or Industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
<input checked="" type="checkbox"/> Surface Soil (0-2 ft bgs)	<input checked="" type="checkbox"/> Direct release to surface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration or leaching to subsurface <i>check soil</i> <input checked="" type="checkbox"/> Migration or leaching to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Runoff or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): 4th and Gambell	<input checked="" type="checkbox"/> soil	<input checked="" type="checkbox"/> Incidental Soil Ingestion <input type="checkbox"/> Dermal Absorption of Contaminants from Soil	C/F	F	C/F	F			
<input checked="" type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input checked="" type="checkbox"/> Direct release to subsurface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Other (list): 2100.38.434	<input checked="" type="checkbox"/> groundwater	<input checked="" type="checkbox"/> Ingestion of Groundwater <input type="checkbox"/> Dermal Absorption of Contaminants in Groundwater <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	C/F	F	C/F	F			
<input type="checkbox"/> Ground-water	<input type="checkbox"/> Direct release to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Flow to surface water body <i>check surface water</i> <input type="checkbox"/> Flow to sediment <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list):	<input checked="" type="checkbox"/> air	<input checked="" type="checkbox"/> Inhalation of Outdoor Air <input checked="" type="checkbox"/> Inhalation of Indoor Air <input type="checkbox"/> Inhalation of Fugitive Dust	C/F	F	C/F	F			
<input type="checkbox"/> Surface Water	<input type="checkbox"/> Direct release to surface water <i>check surface water</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Sedimentation <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list):	<input checked="" type="checkbox"/> surface water	<input checked="" type="checkbox"/> Ingestion of Surface Water <input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	C/F	F	C/F	F			
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <i>check sediment</i> <input type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list):	<input type="checkbox"/> sediment	<input type="checkbox"/> Direct Contact with Sediment							
		<input type="checkbox"/> biota	<input type="checkbox"/> Ingestion of Wild Foods							

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